FOREIGN DIRECT INVESTMENT IN GHANAIAN MANUFACTURING: EXPLORING THE EXTENT OF TECHNOLOGY TRANSFER AND EXPORTING BEHAVIOUR BY FDI FIRMS

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Declaration for PhD thesis

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Emmanuel A. Codjoe

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Abstract

In the light of the growing literature on the benefits of FDI to host countries, many empirical studies have examined the spillover effects, especially productivity spillovers, to domestic firms arising from the presence of FDI in host countries. However, these studies tend to assume that FDI naturally results in the transfer of modern production technology and management expertise, which subsequently spillover to domestic firms via several mechanisms.

However, this study challenges this general presumption that FDI naturally involves the transfer of modern technologies to host countries. The originality and contribution of this research is that it does not simply assume technology transfer via FDI but attempts to investigate if and how it takes place, thus filling a gap in the literature on FDI activities in Africa and Ghana in particular.

Specifically, this study – which is an exploratory research – explores whether FDI activity in the Ghanaian manufacturing sector is associated with the transfer of technology within firms, and assesses the mechanism by and the extent to which this takes place. Furthermore, it investigates the exporting behaviour of FDI firms, and compares the exporting behaviour of FDI firms vis-à-vis domestic firms.

The findings of this research suggest that not all FDI activity is associated with the transfer of technology. Where it occurs, technology transfer is more likely to involve product and process technology compared to skills and technological knowledge. The transfer of skills and technological knowledge via formal training is generally low among senior managers compared to production workers. Evidence also suggests that FDI firms are more exported-oriented than domestic firms, and that export-orientation among FDI firms is positively associated with firm size.

The findings from this study thus provide another perspective on the impact of FDI on host developing countries and points to future policy changes aimed at harnessing the potential benefits from FDI, particularly technology transfer, spillovers, and exporting capacity, as well as the need to incorporate future FDI policy into an overall policy for national industrial development.

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List of Acronyms

ADM	Archer Daniels Midland
AFRC	Armed Forces Revolutionary Council
AGC	Ashanti Goldfields Company
AGI	Association of Ghana Industries
CIB	Capital Investments Board
CPP	Convention Peoples' Party
CSAE	Centre for the Study of African Economies
DIC	Divestiture Implementation Committee
EPZ	Export Processing Zone
ERP	Economic Recovery Programme
FAO	Food and Agriculture Organisation
FDI	Foreign Direct Investment
FINSAP	Financial Sector Adjustment Programme
GDP	Gross Domestic Product
GEMINI	Growth and Equity through Micro-enterprise Investments and Institutions
GFZB	Ghana Free Zones Board
GHACEM	Ghana Cement Company Limited
GIC	Ghana Investments Centre
GIHOC	Ghana Industrial Holding Company
GIMPA	Ghana Institute of Management and Public Administration
GIPC	Ghana Investment Promotion Centre
GMES	Ghana Manufacturing Enterprise Survey
GSS	Ghana Statistical Service
HIPC	Highly Indebted Poor Countries
IDC	Industrial Development Corporation
IMF	International Monetary Fund
ISIC	International Standard Industrial Classification
ISO	International Organisation for Standardisation
ISSER	Institute for Statistical, Social and Economic Research
MNC	Multinational Corporation
MNE	Multinational Enterprise
MVA	Manufacturing Value Added
NIE	Newly Industrialised Economies
NLC	National Liberation Council
NRC	National Redemption Council
OECD	Organisation for Economic Cooperation and Development
PNDC	Provisional National Defence Council
R&D	Research and Development
RPED	Regional Programme on Enterprise Development
SAP	Structural Adjustment Programme
SMC	Supreme Military Council
SSA	Sub-Saharan Africa
TNC	Transnational Corporation
UNCTAD	United Nations Conference on Trade and Development
UNCTC	United Nations Centre on Transnational Corporations
UNDP	United Nations Development Programme
UNECA	United Nations Economic Commission for Africa
UNIDO	United Nations Industrial Development Organisation

VRA	Volta River Authority
WBES	World Bank Enterprise Survey
5YP	Five-Year Development Plan
7YP	Seven-Year Development Plan

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Chapter 1

Introduction

1.0 Background

The beneficial effects of advanced, modern technological know-how in the economic development process of many developed countries cannot be overstated. For many industrialised countries this process, which has witnessed significantly large investments in research and development (R&D) and the upgrade of existing technological capabilities with the associated technological spillovers, has been continuing for many decades. The consequences include the spurring of economic growth and development over the last century. For many developing countries, however, and especially sub-Saharan African countries (SSAs), this has not been the situation. The technological knowledge base has been historically low. Investments in technology, by the state and/or the private sector, have also tended to be low or non-existent. Consequently, it is unsurprising that the benefits of a continuously improving domestic technological capability on economic development have been minimal.

The absence of a viable technological capacity therefore represents a handicap to the development process in these countries. Traditionally, for these SSA countries, the means by which advanced, modern, and in some cases not so modern, technology can be acquired will include the import of capital goods and the positive externalities that can result when workers interact with machinery and equipment embodied with modern technologies, investment in domestic research and development appropriate for the country, learning of new technologies though exporting, and foreign direct investment (FDI), which is usually associated with the activities of multinational firms. Nevertheless, it is apparent that for many SSA countries several of these channels by which modern technologies can be acquired have been unsuccessful.

Consequently, they are still faced with a technologically-constrained position with regard to their capacity to industrialise. Indeed, the case of Ghana is no different. The challenge therefore for Ghana is to improve the technological capacity of the productive sectors, especially the industrial sector, of the economy in order to provide the foundation necessary to ensure sustained improvements in economic performance

and overall societal welfare. This study therefore explores one of the channels by which the transfer of technology to developing countries can occur; namely foreign direct investment.

Ghana's technological position, as with many other SSA countries, is very weak. An UNCTAD (2003a: 16) report on Africa's technological gap notes that many countries in the region "lack the basic prerequisites for technological development, largely on account of a poor *technological dynamism* and an educational system not geared towards meeting "the skill needs of industrial competitiveness". In the face of such a constrained technological position, there appears to be a general consensus among several academic and policy practitioners (UNECA 2006; UNCTAD 2001, 2005; Odenthal 2001; Hanson 2001; Noorbakhsh et al. 2001; Bennell 1990) that the most viable option for countries such as Ghana to overcome this handicap in technological know-how is via foreign direct investment.

Foreign direct investment, as a form of capital flow, appears to be more resilient to the turbulence of financial crises compared to other forms of capital, such as portfolio equity and debt flows (Loungani and Razin 2001; Lipsey 2001a; Dadush et al. 2000). But more importantly, FDI is usually not only associated with real investments and international flows of capital, but is generally regarded as possessing some intangible asset, such as advanced production technology, management know-how, and marketing expertise that is useful for serving foreign markets. These intangible assets are what accord FDI its attractiveness as a viable source of advanced technology for developing countries (and as we shall see later in the literature review chapter, it is this intangible asset which gives FDI firms advantage over domestic firms, especially those in developing countries).

Moreover, the intangible assets that are characteristic of FDI implies that it is viewed as an embodiment of modern advanced technology, with potential welfare benefits to host countries through the introduction of technology and innovation, new managerial techniques, brand names, skills and production know-how (Caves 1974, 1996; Perez 1997; Glass and Saggi 2002; Javorcik 2004), it is a special type of capital, results in job creation, the development of local industrial sectors (Harrison 1994a & b; Haddad and Harrison, 1993; Rodriguez-Clare, 1996; Markusen and Venables, 1999; Lipsey 2001b), and the promotion of exports (Blomström and Kokko 1998). Thus, foreign direct investment is considered an essential component in the development

process of developing countries. However, in the context of this study, our emphasis is FDI as a channel for the transfer of technology, which would otherwise be difficult for developing countries to obtain.

Despite this generally held opinion that FDI inflows have beneficial effects for host countries, Razin (2002) suggests that evidence on the size of the specific benefits of FDI inflows to emerging markets is still very sketchy. Studies by (Aitken and Harrison 1999; Haddad and Harrison 1993) for example suggest that host developing countries do not benefit from FDI. Rodrik (1999: 24) has also strongly questioned the evidence on the benefits of FDI, noting that claims of positive spillovers are "extravagant" and that the evidence of significant positive spillovers arising from FDI in host countries is barely sufficient, indeed "sobering".

Moreover, Loungani and Razin (2001) argue that there is evidence to indicate that there are beneficial effects of FDI for host countries, but it is pertinent that an assessment of such benefits be carefully and realistically undertaken. The spillover effects of FDI have been the focus of many empirical studies assessing the consequences of FDI on the host country.[1] These empirical studies rely heavily on econometric approaches and often use manufacturing or industry panel data or census data. The emphasis on the spillover effects appears to be founded on the belief and expectation that FDI is associated with transfers of modern technologies to host countries. Consequently, spillovers are expected to occur when domestic firms within or outside the sector in which the FDI firm is located, observe the new technologies of the FDI firm, adopt, adapt and become more efficient.

In this study, unlike those that focus on FDI spillovers, we investigate whether FDI activity in Ghana is associated with the transfer of technology. This research therefore approaches the subject of FDI from a different perspective; that is to explore the extent to which the technology transfer attribute of FDI is true in the case of Ghana. This approach is similar to that advocated by the (UNCTAD 2006: 1) briefing paper on assessing the impact of investments by multinational firms in host countries, which advocates for "the use of so-called activity data – production (sales and value-added), labour (employment and wages), trade (exports and imports), innovation activities

[1] Spillovers relate to benefits or costs that emanate from a firm in a particular sector and which spread within that sector and/or to the other sectors within an economy

(research and development), and taxes". In this instance our focus is on the transfer of technology, which is also related to innovative activities by FDI firms.

The choice for this approach to the research is also motivated by the fact such potential spillovers are usually difficult to identify and assess empirically in developing countries in the presence of limited and usually dated firm level data. Moreover, the enormity of data and information needed to undertake a comprehensive assessment of the spillover benefits or otherwise of FDI in Ghana is lacking. A secondary focus of this research is to explore the exporting behaviour of FDI firms, especially because the promotion of exports by FDI firms is another benefit that host countries are expected to reap.

1.1 Motivation and Purpose for the Study

In April 1983, after nearly two decades of economic stagnation and decline, Ghana began implementing the World Bank and International Monetary Fund (IMF) sponsored Economic Recovery Programme (ERP) and Structural Adjustment Programmes (SAPs). One of the primary objectives of the ERP was to arrest the decline in economic performance witnessed in the period prior to the commencement of the reforms. The worst part of the decline was the decade spanning 1972 to 1982; a period in Ghana's economic history that has been characterised by Aryeetey and Harrigan (2000: 11) as "nothing short of an unmitigated economic disaster". Hutchful (2002: 6) characterised the state of the economy prior to the adoption of economic reforms as being in "free fall"; by 1983 real GDP per capita, real export earnings, domestic saving and investment had all declined dramatically.

The economic and social infrastructure was near collapse, the majority of economic transactions took place in parallel markets (Aryeetey and Harrigan 2000), and there was a massive haemorrhage of human capital – the emigration of skilled professionals, including teachers, doctors, nurses, architects, engineers as well as other semi-skilled and low-skill workers, initially into neighbouring Nigeria, Liberia, Gambia, although some went as far as North America, Europe and the Middle East (Anarfi 1982; Anarfi et al. 2000). Although accurate figures are hard to come by Van Hear (1998) for example estimates that approximately 14,000 teachers left Ghana between 1975 and 1981. Further evidence of the extent of emigration to Europe and North America by

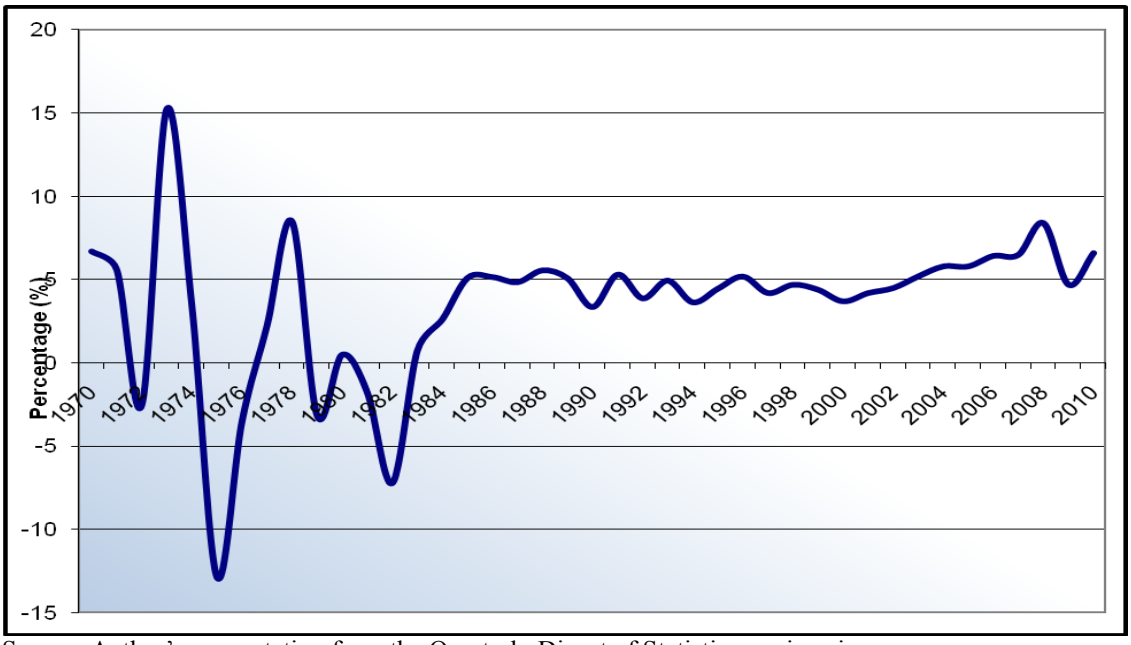
Ghanaian medical professionals is provided by Dovlo (2003) and Akurang-Parry (2002). The consequence of such loss of skilled professionals is apparent in terms of the diminished capacity of the country to cope with the challenges confronting it.

By 1983 the decline in the country's fortunes had reached its lowest point. Killick (2000: 53) notes that the period 1982–83 might in principle have represented 'the nadir of the economy over that decade' because of a drought and large-scale repatriation of workers from Nigeria in 1982. The two events worsened an already dire situation, resulting in extreme social and economic conditions, which probably left the government at the time, the Provisional National Defence Council (PNDC), no choice but to turn to the World Bank and IMF for assistance. That assistance came in the form of the economic reforms under the ERP and SAPs. For a more detailed and extensive analysis of Ghana's adjustment experience, see (Hutchful 2002; Konado-Agyemang 2001; Aryeetey et al. 2000; Donkor 1997; Roe et al. 1992; Shams and Sarris 1991; Ewusi 1987, 1989).

After nearly three decades of pursuing a set of liberal, market-based economic policies growth in real gross domestic product (GDP) has been positive and averaged between 5 and 6 percent from 1984 to 2010. Figure 1.1 depicts the trends in real GDP growth from 1970 to 2010. Prior to 1984 real GDP growth was very volatile with wild swings between 1972 and 1983. Since 1984, real GDP growth has been positive, sustained and less volatile. The apparent association between the period since economic reforms started and the positive growth record by no mean suggests that this was solely the result of economic reforms, although it is impossible to ignore the correlation between the two. For an empirical investigation and analytical discussions on Ghana's growth performance since 1983, see (Kapur et al. 1991; Aryeetey et al. 2001; Leith and Söderling 2003; Aryeetey and Kanbur 2008).

Despite this apparently impressive recovery in real GDP growth, Ghana is still confronted by the challenge to ensure more equitable growth and achieve structural transformation in the economy. The economy has been dominated by the agricultural sector for several decades, although in recent years the services sector has become the largest and fastest growing sector. Rather disappointingly, industrial performance has not been impressive.

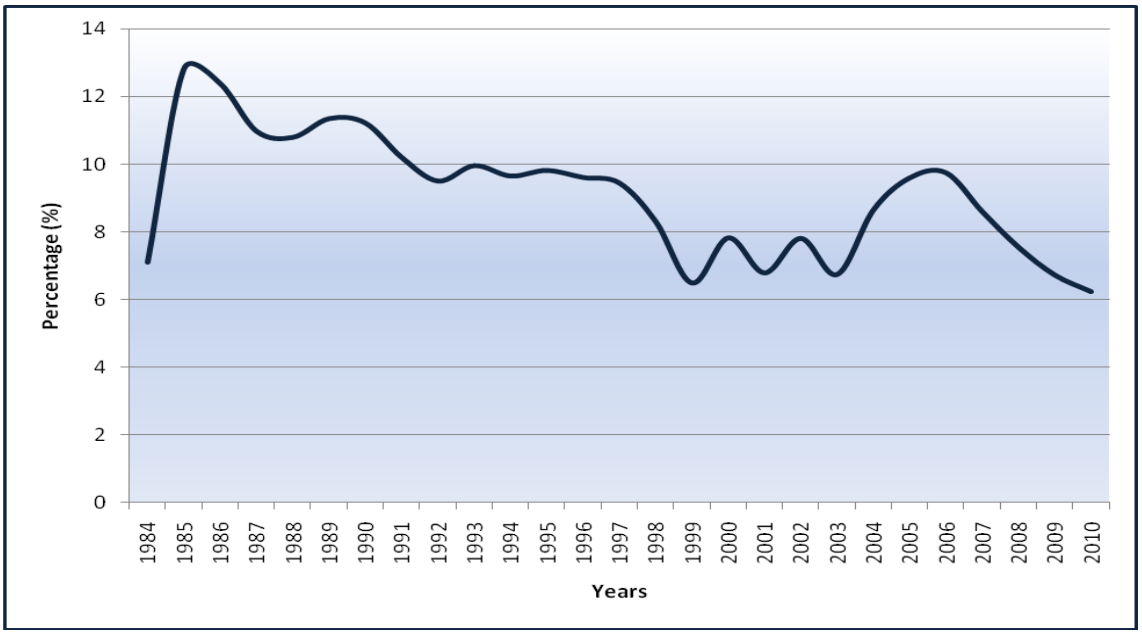
Figure 1.1: Trends in Real GDP Growth for Ghana, 1970 to 2010



Source: Author's computation from the Quarterly Digest of Statistics, various issues

In spite of sustained positive growth in overall GDP, the manufacturing sector (and the industrial sector broadly) has not witnessed dramatic improvements. The average share of manufacturing in total output between 1984 and 2010 has been approximately 9 percent, whilst the average for industrial value-added as a percentage of GDP for the same period has been approximately 23 percent. This trend points to very little change in the contribution of the manufacturing sector (and industry as whole) to overall GDP since the commencement of economic reforms. Indeed, as can be seen from Figure 1.2, trends in the proportion of manufacturing in total GDP have in general experienced a decline. In the immediate years after the introduction of economic reforms, manufacturing performance rose significantly to over 12 percent of GDP in 1985 and 1987, largely the result of increased availability of imported inputs after the liberalisation of inputs, but thereafter the share of manufacturing in total GDP has been choppy and showed a declining trend; a surge occurred between 2005 and 2007, although this appears to have been short-lived. This surge in the contribution of manufacturing to GDP between 2005 and 2007 is also mirrored in Figure 1.3, which also illustrates the trends in exports of manufactures as a share in total merchandise exports from 1997 to 2009.

Figure 1.2: Trends in Manufacturing Share of Gross Domestic Product, 1984-2010



Source: Author's computation based on sources from African Statistical Yearbook, various issues and Quarterly Digest of Statistics, various issues.

Nevertheless, evidence suggests a gradual increase in the share of manufactures in total merchandise exports, illustrated in Table 1.1. On average the share of manufactures in total exports has seen a gradual rise since 1980 although, compared to the average for SSA, Ghana's performance is weak. The share of manufactures in total exports for Ghana relative to that for SSA from 1996 to 2008 is illustrated in Figure 1.4. In Figure 1.4 we observe that throughout the period, except for 2006, the share of manufactures in total exports for Ghana was lower than the SSA average.

Table 1.1: Share of Manufactures in Total Merchandise Exports (in percentages), 1980 - 2009

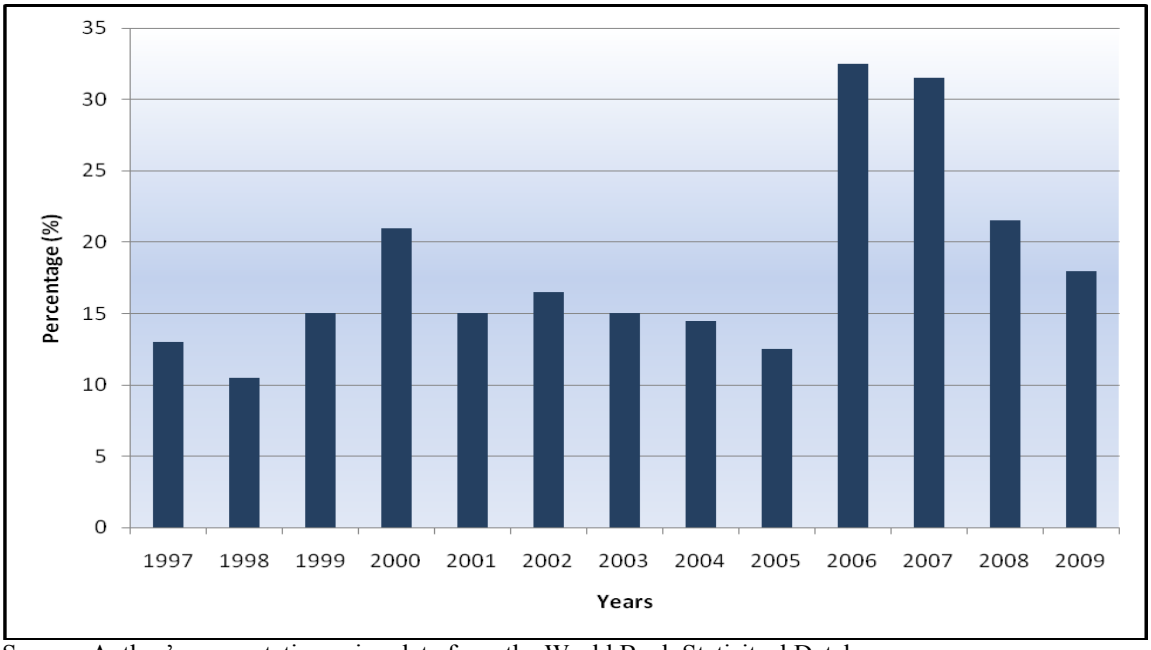
Period	*1980-1990*	*1990-1995*	*1997-2009*
Average Shares (%)	9	13	18.2

Source: Author's computation using data from the World Bank Statistical Database

In spite of the less than impressive performance of the manufacturing sector in Ghana relative to the SSA region, it is worth emphasising the important role the manufacturing sector in particular and industry in general plays in the economic transformation process of developing countries from agrarian economies to industrial economies. The part played by the manufacturing sector, and more broadly the industrial sector in the economic development of industrialised and newly

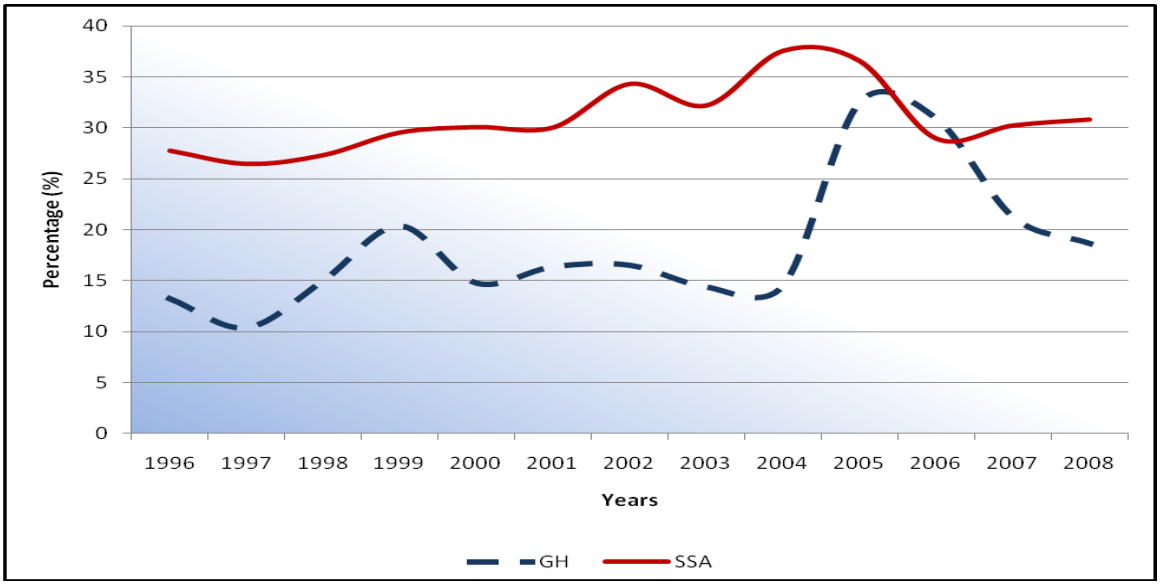
industrialising countries cannot be overemphasised (see for example, Kaldor, 1967; Kitching, 1982; Thirlwall, 2006; and Rodrik, 2009). Despite the important relation between industrial development and economic development, it appears that within the current economic framework of adjustment and reform (largely driven by policies emanating from the Washington Consensus and post-Washington Consensus), very little attention has been paid to the development of the industrial sector in Ghana. The situation appears not so different in several other SSA countries.

Figure 1.3: Share of Manufactures in Total Exports in Ghana, 1997-2009



Source: Author's computation using data from the World Bank Statisitcal Database

Figure 1.4: Trends in the Share of Manufactures in Total Exports, Ghana and SSA, 1996-2008



Source: Author's computation using data from the World Bank Statisitcal Database

Riddle (1990: 5), writing on the African manufacturing sector in the years after several countries began to implement IMF and World Bank sponsored economic reforms, notes that these efforts at resolving "the 'African crisis' had ignored or underplayed the role of industry in general and of the manufacturing sector in particular". He argues that the emphasis on market-based structural adjustment policies were unlikely to result in the manufacturing sector playing a more prominent role in African development. This apparent downplaying of industry under adjustment programmes has been noted in publications by the (World Bank and UNDP 1989; World Bank 1989) *Africa's Adjustment and Growth in the 1980s* and *Sub-Saharan Africa: From Crisis to Sustainable Growth* on the adjustment experience in Africa, although in another publication, *Adjustment in Africa: Reforms, Results and the Road Ahead*, the World Bank (1994) argues that deindustrialisation does not appear to be occurring in Africa. Enos (1995) also argues against the temptation to lay all the blame for the failures of the industrial sector on structural adjustment programmes. Nevertheless, it appears that under structural adjustment there were no specific policies to encourage industrial growth except to rely continuously on market-based policies and institutional reforms.

But in the context of countries in SSA, and Ghana in particular, the development experiences of the newly industrialised countries in East Asia offer a lot of lessons on the way forward in respect of the transition from an agrarian to an industrial economy. The development experiences of countries in East Asia point to the need for an active involvement of the state, directly and indirectly, in combination with the markets in ensuring the successful transformation of most agrarian societies to newly industrialised countries. The importance of the industrial sector, particularly manufacturing, in the successful transformation from an agrarian economy to an industrial economy cannot be overemphasised. Several authors (for example, Pack and Westphal 1986; Westphal 2000) have documented the rise of manufacturing and the important backward and forward linkages the sector generated with the other sectors in the economic development of those economies.

The industrial sector thus possesses the capacity to ensure developing countries shift their comparative advantage away from agricultural exports to manufactures. Westphal (2000) for example points to the important role of exports, especially manufactured exports, in the industrialisation of the successful East Asian countries. But as he argues further, the growth of export-led industrialisation in these countries

was driven by transfers of technology in unprecedented volumes and the subsequent improvement in the innovative capacity of domestic firms. Consequently, many of these firms were able to play an important part in global trade thus enabling these countries to forge supply chains of international scope. As Rodrik (2009: 4) notes, the general lesson from the experience of these East Asian successes is that "high growth countries are those that are able to undertake rapid structural transformation from low-productivity (traditional) to high-productivity (modern) activities… modern activities are largely tradable products, and within tradables, they are mostly industrial ones".

Nevertheless, the debate on the relationship between economic development and industrial development is far from settled. Moreover, the relationship between industrialisation and economic development is also complex, non-linear and path-dependent, although the stylised facts of economic development point to the importance of a dynamic manufacturing sector in the economic development of countries.

In spite of the complexity in the relationship between industrial development and overall economic development, several governments in Ghana have attempted to incorporate industrial development into overall national development plans. Indeed, immediately after independence the government started to pursue a policy of accelerated industrialisation, emphasising import-substitution under the *Seven-Year Plan for National Reconstruction and Development* (Killick 2010; Huq 1989). In 1977 another plan, the *Five Year Development Plan* was launched, which had a similar approach to the Seven-Year plan in terms of industrial development based on import-substitution industrialisation (Huq 1989). Despite the limited success in implementing these programmes, recent development plans (see *Ghana Vision – 2020: The First Step 1996-2000* published in 1995; *Medium-Term National Development Policy Framework: Ghana Shared Growth and Development Agenda 2010-2013* published in 2010; *The Coordinated Programme of Social and Economic Development Policies 2010-2016* published in 2010) have continued to place emphasis on ensuring a structural transformation of the economy, such that industry's share of national output rises from its current average of approximately 25 percent to nearly 40 percent.

In spite of the emphasis placed on industry, there are several challenges confronting the sector. In a recent paper on private sector development in Ghana, Boeh-Ocansey (2008) highlighted the most important challenges facing the industrial sector to include the following: difficulty in raising capital because of high interest rates, limited managerial and technical skills, low marketing skills, and difficulty in getting access to technology.[2] Moreover, he notes that weak institutional arrangements make it impossible for domestic private sector operators to identify, seek and utilise appropriate technology, which also suggests their inability to benefit from foreign direct investment.

Söderbom and Teal (2001b) also note that manufacturing performance, especially export of manufactures, in many Sub-Saharan African countries is constrained by a shortfall in skilled professionals working in the sector whilst manufacturing firms are confronted by prohibitive entry costs if they have to serve foreign markets. Empirical studies (Söderbom 2001; Söderbom and Teal 2000, 2001a & c; Teal 1999; Bigsten et al. 1998) on Ghana's manufacturing sector indicate that performance has been relatively poor over the last two decades in relation to other African countries. This poor performance has been attributed to lower technical efficiency of firms and limited training of workers at the firm level. In a similar vein, Lall et al. (1994) observe that for Ghana the shortages of skilled labour, especially of engineers and technicians, represent one of the major constraints facing the development of the manufacturing sector. These shortages constrained the ability of the manufacturing sector to move from a low-technology into medium-to-high technology manufacturing. Data from the United Nations Industrial Development Organisation (UNIDO) on manufacturing value added (MVA) as a percentage of GDP for Ghana reveal very little change from 1981 to 2005. In 1981, MVA as a percentage of GDP was 9.2 percent, increasing marginally to 9.4 percent by 1991. However, by 2001 this had dropped marginally to 9.2 percent, declining further to 8.1 percent by 2005.

From the preceding discussion two points are worth restating. The first is the importance of the manufacturing sector (and industry in general) as a vital catalyst in the economic transformation process. The second is the generally low level of skills, capacity and technological development in the Ghanaian manufacturing sector. Against this background, it is apparent what role foreign direct investment can play in overcoming some of these constraints faced in the manufacturing sector, not least in

[2] The term 'private sector' is also used to imply the industrial sector, dominated by the manufacturing sector.

respect of technology and skills development. Given the several benefits attributed to foreign direct investment, two important benefits – technology transfer and export promotion – are worth focusing on in the Ghanaian context. In other words, we do not view FDI as simply a source of new capital but also as a channel for the transfer of modern, advanced technology and a promoter of exports.

The importance of foreign direct investment as a source of new capital in Ghana can be seen in the context of relatively low domestic saving and investment, both by the public and private sectors. In the years before the adoption of economic reforms domestic saving and investment declined dramatically. For instance, Brownbridge et al. (2000) observe that capital investments had remained a weak feature of the Ghanaian economy since the end of the state-led investment drive in the mid-1960s. And that during the 1970s and early 1980s economic policies were simultaneously not conducive to investment and discouraging to saving, especially (saving) in a useful financial form. Moreover, as far as private capital was concerned, policies pursued prior to 1984 were generally unfavourable. Consequently, both private and public investment levels declined precipitously; the case of private foreign capital was no different. Prior to 1984, the total average annual inflow of FDI to Ghana was approximately US$19 million.

As part of World Bank and IMF supported Economic Recovery Programme (ERP) and Structural Adjustment Programmes (SAPs), there was also a renewal of attitude – policy wise – towards private capital (both domestic and foreign), which hitherto had been viewed with suspicion. Thus to encourage private investments, especially foreign private investment, in 1985 the government enacted the Ghana Investment Code to provide general incentives, benefits and concessions to entrepreneurs and investors, and special packages for specific sectors such as the manufacturing sector. As a sign of the change in terms of policy towards private investment, Owusu (2001: 56) described the new Ghana Investment Code 1985 (P.N.D.C. Law 116) as “an ultra-liberal investment code introduced to attract foreign investors to boost production for exports”.

The initial efforts at attracting foreign investors were originally welded to the privatisation programmes which started in 1987–88. The privatisation programme was managed by the Divestiture Implementation Committee (DIC), under which the state divested its holdings in existing state enterprises. Over time these initiatives at

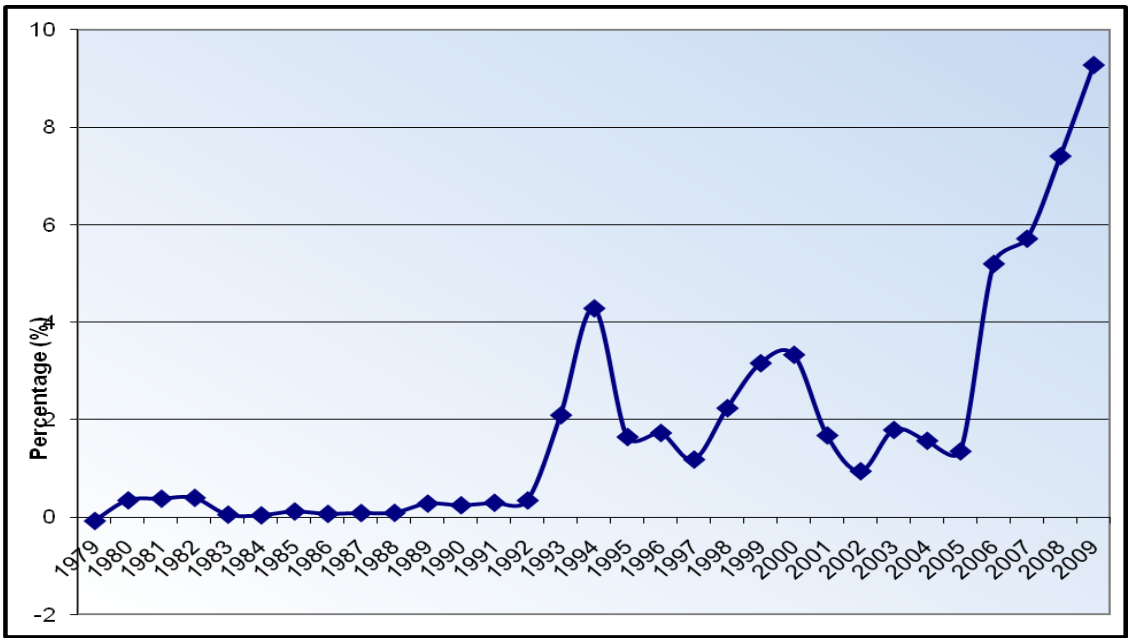
attracting foreign investors gained a life of their own, and were pursued almost independent of the privatisation programme. Thus, by 1994 the Ghana Investment Promotion Centre (GIPC) had been established under a new Investment Promotion Centre Act, which replaced the Investment Code of 1985. The GIPC was established to regulate and promote FDI to all sectors of the economy, except in mining, oil and gas, and the free zones.

In the years after the commencement of the divestiture programme, annual inflows of FDI increased steadily although in terms of proportion of GDP, the volumes were relatively small. Inflows were also relatively small when compared to sub-regional, regional and developing countries average. But significantly, inflows were beginning to rise, with the annual average inflows between 1984 and 1994 rising to US$41 million, more than double the average for the period 1970 – 1983, which was US$19. Between 1995 and 2010 the average annual inflows was slightly over US$337 million. The very huge increase in the average annual inflows for the period 1995 - 2010 is largely the result of huge inflows recorded between 2006 and 2009.

It is thus evident that inflows of FDI have been rising over the years, especially since the late 1990s, and to many sectors of the economy. Figure 1.5 depicts trends in FDI inflows in relation to gross domestic product from 1979 to 2009. It is worth pointing out that these inflows are low in relation to global flows of FDI. In relation to the West African sub-region these inflows account for less than 4% of total sub-regional inflows. Nonetheless, this has not dampened the interest both of policy makers, who continue to pursue policies aimed at attracting more FDI to Ghana, and researchers who examine the determinants and impact of FDI activities in Ghana.

With regard to the current literature on FDI and technology transfer most empirical studies have tended to emphasise the spillover effects of FDI on domestic firms. One shortcoming of this approach, in our view, is the presumption that the presence of FDI necessarily implies the availability of modern technologies to domestic firms, technology which is public good in character. However, we contend that this cannot always be the case, especially in poor developing countries. The production activities of foreign firms may only involve the use of old and stable technologies, which though new to the receipt countries are outdated in the origin countries. It is therefore unclear whether and what type of technology is transferred as a result of FDI.

Figure 1.5: FDI Inflows as a Proportion of Gross Domestic Product, 1979-2009



Source: Author's Computation using data from World Investment Report database and Bank of Ghana's Statistical Bulletin

In the context of Ghana, several empirical studies on FDI have sought to examine the factors determining annual inflows (Tsikata et al. 2000), determinants of FDI activity at firm level (Barthel et al. 2008; Harvey and Abor, 2009), its impact on exports (Abor et al. 2008), and whether it generates spillovers (Görg and Strobl 2005; Waldkirch and Ofosu, 2010). But as we already noted, most empirical work on the topic have focused on the spillover effects of FDI on domestic firms; spillovers may occur in terms of increased productivity, increased wages, or increased export-orientation for domestic firms. In the case of Ghana (Abor et al. 2008; Görg and Strobl 2004; Waldkirch and Ofosu 2010) are recent examples, with studies by (Görg and Strobl 2005; Waldkirch and Ofosu 2010) yielding contrasting results in respect of spillovers to domestic firms arising from FDI.

However, many empirical studies on spillovers from FDI do not explicitly examine whether foreign direct investment in developing countries per se serve as channels through which new technology and other knowledge assets are transferred, from which spillovers might then take place. Indeed, it is assumed that foreign presence implies the availability of new and modern technology as well as other knowledge-based skills that are inherent with FDI activity, and to which domestic firms will have access, either freely by observation, by some form of interaction with foreign managers, or can be acquired at some cost to domestic firms. What therefore makes this research

novel, at least in the context of SSA, is the attempt to explore the extent to which foreign direct investment results in the transfer of technology to Ghana.

We also explore the extent to which FDI activity is likely to result in increased export-orientation by FDI firms. Blomström (1990: 5) notes that FDI is thought to "carry certain potential advantages in entering world markets, such as experience in international marketing and lobbying power in their home markets ... and may help a developing country expand its manufactured exports". Consequently, we expect FDI firms to be more export-oriented and be more likely to export compared with domestic firms.

Thus in one important respect this research differs from much other research on the topic because it does not attempt to assess the extent of spillovers to domestic firms and therefore does not involve the estimation of econometric models using panel datasets on manufacturing activities in Ghana. In essence this is an exploratory research, which relies on own survey data complemented with other survey information to investigate the extent of technology transfer by FDI firms in the Ghanaian manufacturing sector. This approach therefore allows for the discovery of several patterns and behaviour regarding technology transfer by FDI firms operating in the Ghanaian manufacturing sector.

1.2 Research Objectives, Research Questions and Research Hypotheses

The overall objective of this research is to explore the extent of technology transfer activities by FDI firms in the Ghanaian manufacturing sector. In this context technology transfer relates to both research and development (R&D) and non–R&D activities by FDI firms. The concept and measurement of technology transfer are explored in more detail in the literature review chapter (Chapter 2) and the methodology chapter (Chapter 4). Furthermore, we explore whether FDI firms are likely to be export-oriented in the light of the expectation that FDI possesses production and marketing technology that provides FDI firms with an advantage, with regard to access to overseas markets.

Having described the objectives of this study, we state the primary research question of this study as follows:

Does foreign direct investment activity in the Ghanaian manufacturing sector involves the transfer of technology?

More expressly we explore the following specific research questions:

Box 1.0: Specific Research Questions

- What are the main channels of technology transfer via FDI identified in theoretical and empirical research?
- How has government policy on FDI in Ghana evolved since independence, and what has been its impact on aggregate FDI inflows?
- What are the aggregate and sectoral patterns of FDI flows in Ghana?
- What are the main characteristics of FDI firms in the Ghanaian manufacturing sector?
- To what extent does FDI activity involve the transfer of technology to the Ghanaian manufacturing sector?
- What is the exporting behaviour of FDI firms?
- Are there differences between FDI and domestic firms in terms of technological activities and exporting behaviour?

In view of the specific research questions, two working hypotheses are derived concerning the activities of FDI firms in the manufacturing sector:

Box 1.1: Research Hypotheses

Hypothesis 1: There is no difference between FDI firms and domestic firms in respect of technological activities.

Hypothesis 2: There is no difference between FDI firms and domestic firms in respect of exporting behaviour.

1.3 Case Selection and Research Methodology

This research is a country case study on Ghana, which focuses primarily on the technology transfer activities of FDI firms in the manufacturing sector. Whilst a cross-country study will have been exciting, it may have lacked the depth necessary to explore the technology transfer activities of FDI firms. Despite the loss of diversity there is more to be gained in understanding the workings of FDI firms in a specific country context. The choice of Ghana is dictated by a couple of considerations. Firstly, in addition to my originally coming from Ghana, the country was among the first in SSA to commence structural adjustment policies in 1983. This came after two previous attempts, specifically in 1969–72 and 1979-81, to introduce economic reforms that were aimed at restoring fiscal and external balance as well as reforming domestic market distortions in the economy.

However, in both attempts the initial consequences of the reforms were met with disaffection eventually resulting in military coup d'états. Thus, since 1983 Ghana's economic policy framework has been guided by policies emanating from the Washington and Post-Washington consensuses. Moreover, since 1992 the country has led the way in political reform, holding five successive elections, which have seen peaceful changes in governments; a feature which is very rare in Sub-Saharan Africa. The acclaimed success that met Ghana's implementation of political and economic reforms has triggered academic interests into many aspects of the country's social, political and economic life. Thus this research represents part of the long interest in a country that at one time was described as being the "beacon of Africa."

Secondly, it represents a unique case where much effort had gone first into the deliberate liberalisation of investment rules and subsequently improving the general business environment for the private sector. Furthermore, there have been institutional changes aimed at making government agencies, such as the GIPC, more proactive and responsive to the needs of the private sector, and in the case of the GIPC foreign investors. Moreover, as Huq (1989: 269) observes, the "initial industrialisation efforts did not have any policy on technology transfer, at least explicitly, and it was not until 1981 when the new Investment Code (Act 437) mandated the Ghana Investments Centre to approve and register all technology transfer contracts in Ghana". Subsequent investment codes, especially the very recent law, the Ghana Investment Promotion

Centre Act 1994 (Act 478), have maintained this provision on approving and registering technology transfers.

What is more, the GIPC continues to market Ghana aggressively as a desirable investment destination. Nonetheless, official data from the GIPC show that only a small number of technology transfer agreements have taken place since 1995. However, it is reasonable to argue that whilst official data reveal very little by way of technology transfer, one might expect that FDI firms may be engaged in other forms of technology transfer that are not captured in the official statistics. It is against this background that we see this exploratory study as particularly important not just in providing insights into the extent of technology transfer activities by FDI firms, but also contributing to the literature on FDI activities in developing countries.

There are several theoretical channels identified in the literature by which FDI acts as a channel for technology transfer. However, because of the imprecise nature of the concept of technology, no one single measure of technology has been identified. Consequently, the numerous empirical approaches on the subject have employed various measures of technology and used different methods. On the one hand, many empirical studies that have examined FDI activities in host countries have relied on econometric approaches to estimate either the factors that influence investment decisions of foreign investors or the impact of foreign presence on at least one aspect of the host country's economy. Other approaches have relied on in-depth case studies of firms, which permit the careful observation and recording of the various aspects of technology transfer activities carried out in each firm. However a disadvantage with the case study approach is the amount of time required to study one firm and consequently the limited number of firms that can be studied.

The empirical approach chosen for this research, which has been influenced by the primary objective of the research, involves the use of own survey data complemented with other datasets on manufacturing activity in Ghana to examine patterns in FDI activity and the use of statistical methods to compare means, proportions, and determine associations between important firm-specific variables. This therefore excludes the use of any econometric approaches, although we complement

our analyses with information obtained from two case studies of FDI manufacturing firms carried out during our fieldwork in Ghana.[3]

As already stated the main objective in this research is to explore the technology transfer activities of FDI firms in Ghana. But as we shall see later in Chapters 2 and 4, the term technology does not lend itself to a precise empirical measure, thus limiting the extent to which the activities of FDI firms in respect of technology transfer can be directly observed and assessed. Indeed, most of the activities that may be classified as technology transfer can only be assessed ex post. Furthermore, because the matter under investigation involves aspects of the production processes of firms, we employ the use of a questionnaire that is administered in face-to-face interviews with senior managers of FDI firms. The reason for opting for interviews is to understand how technology use and adaptation via FDI occurs at the firm level and how this affects performance, in particular exporting behaviour. We recognise however that to focus on the production process in firms and seek to understand how FDI works entails trying to access information which the firms might consider sensitive and therefore be less willing to share. Nonetheless, our questionnaire design is such as to allow for as much information to be obtained from firms in order to assess the extent of technology transfer undertaken by FDI firms. In Chapter 4 we discuss in detail the methodology used for the survey.

1.4 Definitional Issues

Several concepts emerge within the theoretical and analytical framework that will be used in shaping the discussions in this research. However three important concepts, foreign direct investment, FDI firm and technology, are worth discussing briefly.

Foreign Direct Investment: As we shall see later in Chapter 4 there are several definitional issues concerning the term foreign direct investment. In most official statistical publications, the term usually captures aggregate, macro level flows of investment by multinational corporations. This flow is usually recorded in the capital account of the balance of payments, and is a measure of the long-term, controlling interest by multinational corporations in business entities in other countries. The

[3] We discuss the two case studies in detail in Chapter 4.

threshold for any investment to be considered a FDI is 10 percent or more of equity capital. The term also covers a range of investments, such as greenfield investments, when a multinational firm starts a new business in another country, or brownfield investments, when a multinational firm acquires a controlling stake in an on-going enterprise in another country.

In spite of the clear boundaries of what constitutes FDI, several countries have their own measures resulting in discrepancies in data on FDI. UNCTAD (2006) notes that the sources of these distortions emanate from the way data is collected, defined and reported in each country. Consequently, there are discrepancies between data obtained from international organisations such as the United Nations Conference on Trade and Development (UNCTAD) and government investment promotion agencies. Thus, our research relies on both official statistics from UNCTAD and records from the GIPC. The analyses of trends in annual FDI flows to and from Ghana rely on the use of official statistics from UNCTAD. However, with regard to analysing the activities of FDI firms, we use enterprise data obtained from our survey complemented by data from other surveys. Furthermore, in the analyses of the sectoral patterns of FDI we use data on FDI projects obtained from the GIPC.

FDI Firm: Several empirical studies have tended to focus on subsidiaries of multinationals in host countries as the subject of analysis in research on the impact of FDI. Others tend to use information on the distribution of equity where foreign firms are identified on the basis of the share of foreign investors in total equity. A foreign firm is thus one in which a foreign investor owns at least 10 percent of equity capital. In this research, the FDI firm will consist of subsidiaries of multinationals, firms in which a foreign partner has a controlling interest (at least 10 percent of equity capital), and enterprises that were established by individual foreign entrepreneurs. To be certain of the FDI status of firms, we use several official sources to identify which firms can be described as FDI firms.

Technology: We use the term technology to be synonymous to technological knowledge, which essentially refers to specific production-related activities undertaken by firms, as well as information and knowledge required by managers and workers for production by a firm. But we are also aware that the term lends itself to several interpretations to which we shall return in Chapters 2 and 4. One characteristic of technology that creates difficulties for any empirical study on the question of

technology transfer is its tacitness. This tacit characteristic implies that some elements of technology are not codifiable and thus cannot be readily and directly measured and observed. Consequently several indirect measures relating to inputs, outputs and impacts have been used in empirical studies. In the context of this research we rely on input measures of technology to assess the extent of technology transfer by FDI firms. More generally our measure of technology embodies a wide range of research and development (R&D) and non-R&D activities undertaken by the firm. In Chapters 2 and 4 we discuss in detail the concept of technology and technology transfer.

1.5 Structure of the Thesis

The thesis is structured into eight chapters. Chapter 2 presents a review of the theoretical and empirical literature on foreign direct investment and technology transfer. Whilst the main focus of this chapter is on FDI and technology transfer, we also present a brief survey on the theories of FDI, foreign direct investment in SSA context, a discussion on the benefits of FDI to host countries and a brief discussion on technology and technology transfer. The review of FDI and technology transfer provides the basis for the analytical chapters on FDI and technology transfer. Thus, the literature review enables us to identify the main channels by which technology transfer via FDI can occur and the various measures that can be used to assess the extent of technology transfer by FDI firms.

Chapter 3 presents an analysis of FDI in Ghana, focusing on the evolution of government policies on foreign direct investment, a brief examination of FDI in the mining sector, analyses of annual trends of inflows and outflows of FDI and the sectoral patterns of FDI in the manufacturing sector. The discussion on policies is carried out with the intention of teasing out the impact such policies may have played in influencing the pattern of FDI inflows to both the mining and the non-mining sectors.

Chapter 4 is devoted to a discussion of the methodological approaches used in conducting fieldwork in Ghana. In this chapter we discuss issues regarding the design of the survey method and development of the questionnaire used in the survey. In addition, we present a more detailed discussion on important concepts and definitions relating to the research.

Chapter 4 provides the setting for our discussion in Chapter 5. Chapter 5 presents a discussion on the characteristics of FDI firms surveyed. In this chapter we present and analyse the survey data on FDI firms focusing on important firm-specific variables, such as size, location, age, technology transfer activities and exporting behaviour.

Chapters 6 and 7 present further empirical analysis on technology transfer and exporting behaviour by FDI firms, respectively. In chapter 6 we explore in detail the technology transfer activities of FDI firms and compare these findings with those on domestic firms. In Chapter 7 we first present a brief review of the literature on the relationship between FDI and exports which, is subsequently followed by a detailed analysis of exporting behaviour of FDI firms focusing on identifying important relations between firm-specific characteristics and export-orientation of FDI firms.

Chapter 8, the concluding chapter, presents a summary of the main findings and a discussion on the important implications arising from these findings. We then develop and elaborate a framework for future FDI policy for Ghana. Furthermore, gaps in this research are highlighted, thus highlighting areas where future research is needed.

Chapter 2

Foreign Direct Investment and Technology Transfer – A Survey of the Theoretical and Empirical Literature

2.0 Introduction

The quest by many developing countries to woo foreign direct investment (FDI) is grounded in the expectation, and some might argue a genuine belief, that this type of investment possesses specific advantages in relation to other forms of investments, especially domestic investment. One of the most important benefits of FDI with regard to the growth possibilities for host countries is that of technological know-how. Whilst defining what constitutes this technological know-how is itself not straight-forward, it is generally conceived to consist of superior production techniques and processes, superior managerial know-how, and access to foreign markets.

This chapter reviews the theoretical and empirical literature on FDI with particular emphasis on its role in the transfer of technological know-how to host countries. Because of the vast literature that emerged on FDI and its impact on host and home countries in terms of trade, growth, and exports to list a few of these impacts, no attempt is made in this chapter to provide a comprehensive summary. Rather this review will offer a more focused summary on the role FDI plays in the transmission of technology from developed to developing countries. Before addressing this main issue, we briefly review the theories of FDI, discuss briefly FDI in the sub-Saharan African (SSA) context, and subsequently review the literature on the benefits of FDI to developing countries. This sets the tone for the main focus of our discussion in this chapter; the review of the literature on FDI and technology transfer to host countries.

2.1 Theories of Foreign Direct Investment

The literature concerning FDI is now growing and covers a range of issues, such as why FDI takes place in the first place, how it takes place, where it takes place, the determinants of FDI activity, and the impact on host and home economies. The theoretical debates around FDI have evolved from seeking explanations of why such activities arise in the first place, to examining what the impacts of these kinds of investment activities are on home and host countries. Consequently theories of FDI can be broadly classified into those which seek to explain FDI and their investment location decisions and those analysing the impact of FDI on many aspects of host and home economies. It is an arduous task to provide a comprehensive survey of the literature on FDI theories; hence the focus of this section will be limited. The purpose of this section is to provide a brief general discussion of the theories of FDI emphasising the locational aspects and the associated consequence of FDI in host economies. We will however not discuss the definitional issues concerning the term FDI; these are discussed in the methodology chapter.

2.1.1 FDI within the Factor Proportions Model

Early theoretical analysis of FDI began with work on the factor proportions model of international trade. The seminal work of Mundell (1957) argued that in the face of tariffs, which impede the free trade in goods, FDI arises. That is, national firms in one country unable to export freely to the other country relocate capital to the other country to overcome the impediments to free trade. The consequence of such capital movements (which we may loosely refer to as FDI) within the Heckscher–Ohlin-Samuelson model is to displace trade; thus capital movements act as a substitute to trade.[4] Subsequent theoretical contributions to the work of Mundell, such as those by (Falvey 1976; Olivera 1967; Rakowski 1969; Neary 1995) to name a few, focused on whether the movement of capital – or as in (Neary 1995), both capital and labour – from one country to another displaces trade (acts as a substitute to trade) or increases trade (as a complement to trade). Because the movement of capital is motivated by the desire to overcome obstacles to trade, the implication from this approach is that with free trade, capital mobility will be unnecessary.

[4] This suggests that FDI and trade (exports) are related, and in Chapter 7 we review briefly the relationship between FDI and exports.

However, this framework did not provide an adequate explanation for the existence of multinational firms and their very close association with FDI. Within this framework other forms of factor flows, such as labour could result in outcomes that were similar to that of capital movements. Moreover, in these models of trade with factor mobility, the unit of analysis is the country not the firm, which therefore precludes the decision-making that takes place when foreign production is to be carried out.

2.1.2 Explaining Overseas Production – Early Work on Theories of Foreign Direct Investment

Early work on FDI was carried out by Hymer (1960, 1976) and Vernon (1966). Both were concerned about the activities of United States firms operating overseas, especially explaining why US firms will operate in other advanced industrialised economies. The work by Stephen Hymer was an investigation into the value-adding activities by US firms outside the United States, especially in Canada and Western Europe. But, as Dunning (2001a: 37 - 38) indicates, Hymer's interest was not to explain FDI per se. Hymer's interest was to explain why firms will want to own or control their foreign subsidiaries. This is because these overseas operations were integrated into the whole production process with the parent company at the centre.

Vernon's (1966) product cycle model was more macro- and trade-oriented compared to the industrial-organisation approach of Hymer. But as in the case of Hymer, Vernon did not seek to explain FDI per se. Dunning (2001a: 37 - 38) notes that Vernon's emphasis was on how country specific factors influenced both the origin of the competitive advantage of firms and the location of the value-added activities arising from them. Foreign production is likely to occur as the demand for a product expands and a certain degree of standardization takes place. In addition, with the attainment of some degree of maturity for the product and an increased threat of competition from foreign firms, the production of this product is likely to move overseas.

Dunning (*ibid*) provides a summary of other research on FDI by researchers such as that by (Pavitt 1987; Cantwell 1989; Cantwell and Hodson 1991), who stressed the importance of location-bound characteristics of home countries, such as their innovatory capabilities in particular sectors, as important reasons for firms to engage in

FDI. Other strands of research included that by (Knickerbocker 1973; Flowers 1976; Graham 1978) in the business school tradition, and those by (Aliber 1971; Rugman 1975, 1979) in the international finance tradition. The emergence in the 1980s of the work by (Nelson and Winter 1982) on the evolutionary theory of the firm provided the basis for work explaining the trajectory and growth of other kinds of multinational enterprises by (Cantwell 1989). This approach takes a more dynamic and path-dependency perspective in explaining the activities of multinational enterprises (MNEs) in respect of FDI.

In a series of papers, Dunning (1958, 1972, 1973, 1977, 2001a, 2001b) provided the basis for what became known as the eclectic theory of international production. Dunning and Lundan (2008: 95) note that it "offered a general framework for determining the extent and pattern of both foreign-owned production undertaken by a country's own enterprises, and that of domestic production owned or controlled by foreign enterprises". This framework represented a significant advance in the analysis of FDI and international production, that is, production financed by FDI and undertaken by MNEs. This framework was an attempt to provide answers to the *why*, *where*, and *how* MNE activity took place. The theory rested on three broad constituents; ownership advantages (O), locational considerations (L), and internalisation advantages (I). The eclectic theory thus became termed the OLI framework.

In brief, the ownership advantages refer to the owner-specific assets of a firm, such as human capital (managers), patents, technologies, and brand, which are spatially transferable to other locations without loss of value. Locational considerations arise due to non-transferable characteristics of the host economy in which a firm operated, hence the need to locate value-added production outside their national boundaries. Internalisation advantages arise when firms perceive it in their best interest to internalise the markets for the generation and/or use of these assets. For a detailed discussion of the theories of FDI, see (Dunning and Lundan 2008: 79-105; Hennart 2009).

2.1.3 Multinational Enterprises and Foreign Direct Investment

As a business organisation operating in more than one country, the activities of multinational firms have provided the basic framework for the analysis of FDI. Markusen (1995) argues that multinationals are firms that engage in direct foreign investments, defined as investments in which the multinationals acquire a substantial controlling interest in a foreign firm or sets up a subsidiary in a foreign country. In this regard, the multinational firm sometimes referred to as the multinational corporation (MNC), the multinational enterprise (MNE) or the transnational corporation (TNC) is distinguished from the national enterprise (NE) in the sense that the NE only operates in the country in which is it established; all production plants, assets and headquarters are located in a single country.[5] The multinational firm on the other hand will have different production units or assets located in more than one country. But why would a firm (national enterprise) choose to have its production units located in more than one country; in other words, why will it choose to internationalise its productive activities.

Penrose (1987) argues that the emergence and growth of MNEs is very much in line with the theory of the growth of firms. Her argument is based on her earlier work in 1959 on the growth of the firm. In this regard, the expansion of MNEs can be viewed as a natural expansion of the domestic firm through investment overseas. But in terms of why NEs will extend their reach beyond the national boundaries into other countries, the work by Jack Behrman in 1972 has been very important. Behrman (1972a&b) provided the initial categorisation of the motives for foreign production. These were natural resource seeking, market seeking, efficiency seeking, and strategic asset or capability seeking. Dunning and Lundan (2008: 74-75) expand on Behrman's initial work by adding three motives for foreign production. These are Escape investments, Support investments and Passive investments. Drawing extensively on Dunning and Lundan (2008: 68-75) we summarise what these motives are in the next paragraphs.

Natural resource seekers invest overseas to acquire specific resources of a higher quality at a lower real cost that could be obtained in their home country. The resource seekers could be motivated by the need to access physical assets such as minerals and oil, or the availability of cheap and well-motivated labour, or the need to acquire technological, management, marketing and organisational capability. The

[5] In this study we use the term multinational enterprise (MNE) to represent all forms of enterprises with various aspects of their operations located in several countries. Hence MNE is synonymous with MNC and TNC.

market seekers invest in a particular country in order to supply goods and services to that country or adjacent countries. The motivation for market seekers include the need to protect existing markets or exploit new ones, the need to adapt products to particular markets, the need to reduce transactions costs in supplying a particular market, and the need to have a physical presence in a leading market, which is also served by competitors.

Efficiency seekers aim to rationalise the structure of established resource-based or marketing seeking investment in a manner that allows the company to gain from the common governance of geographically dispersed activities. Strategic asset seeking investors acquire the assets of foreign corporations in order to promote their long-term strategic and global competitiveness. Escape investments, as contrasted with capital flight, arise from the need to get out of restrictive legislation or macro-organisational policies by home country governments. Support investments arise from the need to provide support to the activities of the rest of the enterprise of which they are a part. Such support includes the promotion and facilitation of exports from the investing or other companies. Passive investments can be described as those in which the degree of active management pursued by the owners is passive. Two kinds are distinguished; large institutional conglomerates that specialise in the buying and selling of companies, and the kind made by small firms and individual investors in real estate.

The contributions of international trade theorists working from about the early 1980s in aspects of the discipline, which has been termed *new trade theory* and in the literature on *geography and trade* to explain the activities of MNEs, and by extension FDI, cannot be ignored. The analytical contributions have largely sought to describe the conditions that result in the emergence of multinational firms endogenously within the standard general equilibrium trade theory. Notable among these contributions within the new trade theory literature include that of (Batra and Ramachandran 1980; Helpman 1984, 1985; Helpman and Krugman 1985; Markusen 1984, 1989, 2002; Ethier 1986; Horstman and Markusen 1987, 1992; Ethier and Markusen 1996; Brainard 1993, Markusen and Venables 1991, 2000).

These analytical approaches, developed within the Industrial Organisation approach to international trade, represented an "extension to Dunning's OLI framework" (Markusen 2002: 17). The primary objective of these approaches was to incorporate multinational firms into the standard general equilibrium trade models, and

thereby explain the circumstances under which corporations, usually NEs, find it profitable to become multinationals. Markusen (*ibid*) uses the term 'knowledge capital' model to describe a combination of the various analytical approaches on the subject matter. And as Navaretti and Venables (2006: 24) note the contribution of these analytical approaches to the theoretical work on MNEs and FDI have been to develop the OLI approach into a consistent and formalised analytical framework.

The main argument underlying the 'knowledge capital' model is that national enterprises (NEs) possess and control firm-specific assets, such as technology, brand name, product-specific R&D, marketing and management and physical capital, which gives them the advantage to operate in several locations internationally. However, the most important asset is knowledge capital, which is defined to include, human capital, patents, blueprints, production procedures, other proprietary knowledge and marketing assets. The advantage knowledge capital has over physical capital is the ease with which it can be transported to other plants overseas. Firms (national enterprises) are thus faced with decisions regarding whether and how to serve foreign markets.

Multinational firms arise endogenously in these models through a combination of ownership (firm-specific) and location advantages. Helpman (2006) argues that these firm-specific characteristics are responsible for determining which NEs choose to serve foreign markets via FDI and how they serve them; these characteristics also determine whether they become horizontal or vertical multinationals (Markusen 2002).[6] But this traditional classification of FDI motivations has been criticised by Helpman (2006) as being less meaningful in a changing and complex business environment because of changes in the sourcing strategies of business firms, which have become more complex, as well as changes in the integration strategies of MNEs.

To summarise our discussion so far, we note that early attempts to provide theoretical explanations of why foreign direct investment arises can be traced to the work by Hymer and Vernon on the activities of multinational enterprises. Prior to this, the analytical approaches by Mundell and other researchers using trade models had not yielded significant insights into FDI theory. However, from the early 1970s the work by Jack Behrman provided the basis for further work on FDI theory by John Dunning, who subsequently proposed the OLI framework for explaining FDI activity. Further

[6] Horizontal multinational firms engage in foreign production of products and services that are similar to those it produces for the home market, while with vertical multinationals the production process is geographically fragmented by stages of production

advances at explaining FDI have been made since the OLI framework was developed. In the last three decades the OLI framework has also become the basis for much of the analytical advances by new trade theorists, who have combined general equilibrium trade models and theories of industrial organisation to explain the activities of multinational enterprises and FDI.

2.2 Foreign Direct Investment in the Sub-Saharan African Context

The sub-Saharan Africa (SSA) region has been an unattractive region for FDI until recently. This is the result of what has emerged as a general consensus among many researchers on Africa that the 1970s, 1980s and the early part of the 1990s can be considered lost decades (Odenthal, 2001). This situation was in part due to a rather negative image of a region ravaged by war, civil strife, political instability, widespread poverty and mass deprivation. But it was also partly due to the types of economic and political systems in place, which was largely hostile to and suspicious of foreign investments. As Bennell (1997: 127) observes, during the 1960s and 1970s the majority of newly independent African states adopted socialist or quasi-socialist development strategies, and in relation to MNEs, he notes that MNEs were considered as "an increasingly dominant and pernicious form of international capitalist exploitation".

Another reason for the unattractiveness of SSA as an investment region for foreign investors, which is probably the consequence of factors stated in the preceding paragraph, was the generally poor economic performance of many countries, especially in the 1970s and 1980s (see Killick 1983; Collier and Gunning 1999; Arrighi 2002, for an extensive discussion on the poor economic performance in SSA and its causes). This apparent link between economic performance and foreign investor interest seems to be borne out by the association between increased inflows of FDI and improved economic performance among several SSA countries in the last decade. This is however not to disregard the importance of other factors in explaining the increased inflows of FDI to the region in recent years.

Moreover, other factors, such as the poor state of infrastructure in many countries in the region, inward-looking policies, such as import-substitution industrialisation, capital controls and restrictions on trade account for the low inflow of FDI. Consequently, most of the inflows of FDI were limited to the very attractive

sectors of SSA economies, that is, its natural resources. Thus, in spite of inhibiting factors, where a country possessed abundant natural resources, FDI often flowed in unless profits were threatened. As a result, prior to the early 1990s, the inflow of FDI to SSA was mainly limited to resource exploitation, such as in minerals and oils, and to a few manufacturing concerns taking advantage of cheap labour or the presence of raw materials. In a few cases, notably in Nigeria and South Africa, vehicle assembly plants were set up to produce vehicles that serve national and regional markets.

From the early 1980s however, there began a gradual change in a few SSA countries, especially on the economic front. A few countries began to implement World Bank and IMF inspired economic reforms. An UNCTAD survey revealed that by the mid-1990s nearly three-quarters of SSA countries had signed up to the economic reform package of the World Bank and IMF (UNCTAD 1999). Consequently, the trend in the inflow of FDI to SSA began to change as many countries put in place policies to attract FDI. FDI inflows were significantly higher in the 1990s than the decades before despite a slight decline in the overall share to the region (UNCTAD 2000).

The absolute increase in the inflows of FDI to SSA can therefore be partly explained by the shift in economic and social policies away from dirigisme to what has been broadly termed the Washington Consensus and post-Washington Consensus policies, partly by the huge surge in global flows and increased importance of FDI, and partly by increased demand by India and especially China in the last decade for mineral and oil resources in SSA. UNCTAD (2003b) has for example noted that from 1991 to 2002 over 1,500 changes in national regulations for FDI were carried out thus making national policies more favourable to FDI. During the same period, it also reports an increase in the use of locational incentives to attract FDI. Hence, the trend in SSA is a reflection of a changing attitude towards FDI as well as the changing impact of FDI itself in other regions of the world.

The early research on FDI and the SSA region was focused on the determinants of inward FDI flows. Given that many countries in SSA were resource rich, notably oil and minerals such as gold and diamonds, it was unsurprising that this location-specific characteristic was the major determinant of inward FDI flows to SSA. However from the beginning of the 1980s, many countries began to implement economic reforms under the auspices of the World Bank and IMF structural adjustment and stabilisation programmes. After nearly a decade of economic reforms, a wave of democratisation

began to sweep across parts of the continent. Thus in nearly two decades, both economic and political reforms had succeeded in changing the image of a region which hitherto had been portrayed in a negative and depressing light. As we have noted earlier, at the beginning of the 1990s, inward FDI flows to SSA began to increase compared to the previous three decades. In this light many studies began to evaluate the factors that might be influential in explaining the surge in inward FDI. So whilst endowment factors appear to have been the major determinants of inflows in the previous three decades prior to the early 1990s, recent studies have tended to investigate if other factors can account for FDI inflows.

The concern among policy makers and academics was in regard to the low share of FDI inflows to SSA relative to the rest of the developing world. Hence, research was driven to investigate why this may be so. As noted previously, the abundance of natural resources, especially minerals and oil accounts for the large number of resource-based FDI projects, which can be explained based on Dunning's eclectic theory of FDI. UNCTAD (1998) and McKern (1996) have argued that availability of natural resources in host countries was the most important determinant of inward FDI. But in addition to the location specific factors, which have featured in many empirical studies, there has been a focus on economic, political, geographical and social factors.

Using panel data on SSA countries, (Asiedu 2002, 2004a, 2004b, 2005; Morriset 2003; Ndikumana and Verick 2008) have shown that government policies, such as openness to foreign investment, the degree of trade openness, the level of infrastructure development, as well as the quality of institutions, the political environment, the level of financial development, market size, and the degree of corruption are important determinants of FDI in addition to natural resource endowments. In a similar vein, Onyeiwu and Shrestha (2004) in a study of 29 SSA countries find economic growth, inflation, openness of the economy, and the level of international reserves were significant determinants of FDI inflows. Rather surprisingly, they find that a free political environment (political rights) and the level of infrastructure development were not significant determinants. This finding runs contrary to the received wisdom regarding the role played by infrastructure and political freedom in respect of FDI inflows. Ndikumana and Verick (2008) find strong correlations between domestic investment and foreign investment, and argue that in countries with higher domestic investment, foreign direct investment is likely to be

higher because domestic investment signals the extent of the returns to investment in such countries.

FDI is also likely to be attracted to countries with a better macroeconomic environment and an investment climate with potentially higher returns to investments. Rogoff and Reinhart (2003) argue that countries that pursue policies which create an attractive investment climate through the pursuit of macroeconomic stability, improve on governance, and reduce corruption are more likely to receive higher inflows than those that do not. Madaro and Sarbid (1999) also argue that in addition to macroeconomic stability, political stability is important at encouraging inflows of FDI. Odenthal (2001) suggests that the creation of regional trade areas in Africa have encouraged more FDI inflows, especially to countries in East and Southern Africa. Similar studies (Schneider and Frey 1985; Singh and Jun 1995; Bathattachrya et al. 1997; Gastanaga et al. 1998; Gyimah-Brimpong and Traynor 1999; Noorbakhsh et al. 2001; Udomkerdmongkol and Morrissey 2008; Ajayi 2006; Tsikata et al. 2000) have all affirmed the importance of economic and political factors as important determinants of FDI flows to developing countries. Basu and Srinivasan (2002) in a survey of selected African countries also reiterate the importance of political and macroeconomic stability as key contributors to the success of countries that have attracted significant FDI inflows.

Despite these findings, which suggest that FDI flows have increased as a result of good economic policies and political reform Pigato (2000) argues that host countries need not maintain good policies to attract FDI. Analysing average inflows to SSA, she observes that at least a third of recent increases in FDI inflows have gone to four countries, which have some of the worst policy and financial risk ratings in SSA. These countries, Angola, Congo Republic, Equatorial Guinea, and Nigeria, are all oil-exporting countries. The argument here being, resource-rich countries will attract significant FDI inflows anyway. However, on the issue of the policy environment, she appears to hold a contrary opinion to those she previously stated.

Writing a year later, Pigato (2001) notes that in spite of the progress made in the economic and political environment, which has resulted in increased inflows of FDI, these changes are still inadequate to attract high quality, efficiency-seeking, globalising FDI. She argues that policies are still restrictive in certain respects, countries still maintain discretionary powers over incentives, and agencies in charge of FDI

promotion have not effectively transformed themselves from the regulatory framework to the promotional one. Consequently, the SSA lags behind in attracting significantly higher amounts of FDI, especially high-quality, export-oriented FDI.

In summary, we observe that most empirical work on FDI in SSA has focused on identifying the determinants of FDI inflows. Several important determinants such as, economic and political environment and the presence of natural resource endowments explain the pattern of inflows. However, the diversity of countries in SSA suggests that there is great variability in the number of factors that can fully explain the pattern of inflows to particular countries.

2.3 On the Benefits of Foreign Direct Investment to Developing Economies

In this section we present a summarised general discussion on the benefits of FDI to host developing countries. Subsequently we discuss one of the much trumpeted benefits of FDI, technology transfer, looking at the means by which technology is transferred via FDI. We also discuss the potential firm and industry level impacts of FDI in host developing countries.

The benefits of foreign direct investment to host countries have been trumpeted by among others Dunning (1993a, 1993b), who for example argues that the activities of multinational firms are expected to result in knowledge transfer, infusion of new capital, employment generation, stimulate competition and stimulate exports. In the last two decades this favourable view of FDI has led many developing countries to introduce fiscal incentives and liberalised FDI regulations in order to attract more foreign direct investments. But despite this increasingly favourable view of FDI, its impact cannot be viewed entirely as benign or benevolent.

Direct foreign investment, as Koizumi and Kopecky (1977) note, is motivated by the opportunity of reaping profits abroad, which is made possible through superior technical know-how and managerial expertise. And as Richardson (1998: 251) argues the domestic welfare effect of foreign entry is generally ambiguous, suggesting that a "little" entry may be harmful while a "lot" is beneficial. Indeed, whether a country benefits from FDI depends on host country characteristics such as trade and investment policies, the available stock of human and physical capital, and the nature and

motivation of multinational investments, that is, whether it is efficiency- or resource-seeking.

2.3.1 Early Scepticism about Foreign Direct Investment

The question of whether foreign direct investment is good for developing countries has been strongly debated in the literature for nearly six decades. Early development economists, writing from about the late 1950s onwards, argued that the activities of multinationals will be detrimental to host economies, particularly developing countries. Singer (1950) for example had argued that the activities of multinationals created little if any multiplier effects, in terms of income, employment, productivity increases, capital, technical knowledge and growth of external economies, in the host countries. The enclave nature of such foreign investments meant they did not result in any positive spillovers for host countries. The malign effects of FDI include tax concessions offered by countries in a bid to attract FDI, which in turn have fiscal implications; unacceptable intrusion in political process; and the exploitation of workers.

Lall (1974: 43-46) distinguishes between the pro-foreign investment school and the anti-foreign investment school. The pro-foreign investment school is founded on the 'business school,' 'traditional economic,' and 'neo-traditionalist' approaches, which argues that FDI constitutes a net addition to investible resources in host countries thus raising output, employment and economic growth rates, resulting in a desirable growth pattern. Other benefits include the introduction of new technology, better management and organisation, superior marketing and cheaper finance (Kindleberger, 1969; Vernon, 1971; Reuber et al. 1973). On the other hand, the anti-foreign investment school is founded on nationalist, dependency, and Marxist approaches. They argue that foreign investment damages developing economies by suppressing domestic entrepreneurship, introduction of unsuitable technologies and products, extension of oligopolistic practices, worsening of income distribution, extraction of economic surplus (or exploitation), and retarding real economic development in these economies (Sweezy and Magdoff 1972; Hymer, 1972; Streeten, 1973; Streeten and Lall, 1973; Schwartz 1994). Regarding the detrimental effects of multinational firms on host countries, this point by Markusen and Venables (1999: 1) is worth stating, "… in the 1970s, many

host country governments and some economists viewed multinational investment as detrimental to host economies' welfare and development, creating monopoly situations that exploited those economies and stifled competition".

Elson (1999) also notes that economists within the dependency school argue against the involvement of multinational enterprises (MNEs), who are the main conduits of FDI, in the economies of developing countries. This opposition to the involvement of MNEs in developing economies arises from the prediction that such dependence is negatively related to economic growth and development. In general, the dependency theorists argue that the relationship between developing countries and developed countries is organised to perpetuate the economic underdevelopment of these developing countries (McGowan 1976). The involvement of MNEs they argue results in the appropriation and repatriation of a surplus (profits) from developing countries. Indeed, such repatriation of profits as argued by Prebisch (1950a) poses potential balance of payments problems for countries that permit investment by MNEs. Hansen and Rand (2006) also note that in spite of the positive role FDI can play in creating a better economic environment, there are potential drawbacks on the balance of payments and stifling competition in host countries.

Additionally, dependency economists have argued that agreements between MNEs and developing countries are unfair and skewed in favour of MNEs. Other issues raised include that of transfer pricing, which deprive developing countries of the full benefits of taxes and revenues; the enclave nature of most MNEs, which render the transfer of technology and other forms of knowledge impossible; and a negative influence on political and economic decision-making thus generally resulting in the corruption of the elite and which eventually results in greater subjugation of the majority of the populace. Indeed as Kozul-Wright and Rowthorn (1998) observe, towards the end of the 1960s many development economists had raised concerns about the growing influence of MNEs in developing countries, with policy debate, both in the North and South, centred on how best to curb the power of international big business. And from the beginning of the 1970s FDI was considered detrimental to host economies' welfare and development, with fears that it might create monopoly situations, which might exploit those economies and stifle local competition (Markusen and Venebles 1997).

2.3.2 The Positive Appraisal of Foreign Direct Investment

In the last two decades however the hostility towards foreign investment activities in developing countries has softened. Now, there appears to be a growing consensus on the beneficial effects in host economies with several countries actively encouraging foreign investments. It is worth pointing out that this thawing in opinions towards FDI can also be traced to the economic growth and developmental experiences of the first-tier of newly industrialised economies (NIEs) in East Asia. Initially, these countries were extremely selective and restrictive towards FDI, although this changed in the course of time. These countries increasingly relied on industrial policies that encouraged FDI with the goal of improving the productivity of domestic firms and the inflow of new technologies. Consequently, in the last two decades the view has changed to a more optimistic one, particularly in developing countries where a race to the bottom appears to be ongoing to attract as much FDI as possible.[7]

This favourable view is also based on the belief that there exist possibilities for FDI to complement local industries and therefore create the channels by which the host economy benefits. The expectation from such linkages between domestic and foreign capital is a stimulus that engenders economic growth and eventually economic development. Lipsey and Sjoholm (2005) for example observe that it is generally taken for granted that foreign firms investing in a host economy possess some superior technology, which permits them to produce high quality goods and services at either lower prices or in greater volume resulting in higher consumer welfare.

There are several benefits of FDI to host countries noted in the literature which, as De Gregorio (2003) points out, might give rise to beneficial externalities that promote growth. These benefits include being a source of capital for capital-scarce developing countries, particularly in SSA, who also desire to industrialise. As a source of capital, Harrison (1994) notes that since the 1990s, foreign direct investment has become the single largest source of private capital for developing countries. UNCTAD (2000) also note that as a source of external finance for developing countries, FDI has become more important than commercial loans, portfolio investment, and official development assistance since the during 1990s. Bosworth et al. (1999) also argue that such capital inflows supplement domestic saving and thereby raise the rate of capital

[7] The race to the bottom refers to actions taken by host countries to attract FDI. These actions, mainly regulatory and fiscal policies, include loose environmental protection, relaxed labour standards, tax holidays and other incentives and assurances.

accumulation. Lipsey and Sjoholm (2005) suggest that with the increase in capital stock resulting from FDI, output levels will be raised.

Nonetheless, Graham and Krugman (1991) and Lipsey (2002) have argued that foreign investors are not always likely to fully transfer capital once they acquire a controlling interest in a firm. In fact, these acquisitions may be financed using the financial markets in the host economies. Thus, the expectation that FDI involves capital transfers from foreign to developing countries may not always be true, and will therefore have to be empirically verified. The experiences of several countries during the privatisation of state-owned enterprises also offer support for this view. The privatisation programmes in several developing countries provided the platform of initial inflows of FDI. However, Nellis (2006) notes that in several transition countries, such as Russia and Mongolia, thousands of firms were divested for vouchers, meaning no payments were made. In other words, although foreign investors will have gained management control of domestic firms, these transactions will not involve any financial payments.

Probably the most highlighted aspect of the impact of FDI, its growth impact, has also been well noted in the literature. De Mello (1999) for example argues that the important role FDI plays in output growth, capital accumulation and technological progress is less controversial in theory. However, in practice the results appear to be mixed. De Gregorio (1992) in a study on economic growth in Latin America from 1950 to 1985 shows a positive impact of FDI on economic growth. However, Johnson (2006) argues that despite the straight-forward relationship suggested by the theoretical literature, empirical evidence on a positive relationship between FDI inflows and economic growth has been elusive; it indicates that the growth impacts are obtained only in the presence of certain host country characteristics. For example, Blomström et al. (1994) find a positive relationship only for high income countries, whilst in Borensztein et al. (1998) and de Mello (1999) countries require a minimum threshold of human capital stock for the growth enhancing impacts to be realised.

In other studies on the growth impact of FDI, Alfaro et al. (2004) find that this is positive if domestic financial markets in host economies are sufficiently developed. In a more recent study, Alfaro et al. (2009) confirm that whilst the growth effects are more pronounced when a country has a well-developed financial system this is possible via total factor productivity improvements. They however argue that factor

accumulation does not represent the channel through which countries can benefit from FDI. Lumbila (2005) in a study of the growth impacts of FDI in selected SSA countries found that countries with a well-developed infrastructure, higher level of human development, stable macroeconomic environment and with a lower risk were more likely to experience the growth impact of FDI.

In similar studies Balasubramanyam et al. (1996) and Greenaway et al. (2007), the degree of export orientation or openness of an economy has been found to be important. Thus, countries which are more open tend to benefit more from FDI than those less open. Olofsdotter (1998) on the other hand has argued that the quality of host country institutions, measured by the degree of property rights protection and bureaucratic efficiency, influence the growth impact of FDI. Kinishita and Lu (2006) find that FDI promotes growth only if a country's infrastructure is sufficiently developed. Carkovic and Levine (2002) also find no evidence that FDI inflows exert an independent influence on economic growth. Choe (2003) also find little evidence of the growth effects of FDI; the contrary rather appears to be the case, with economic growth strongly affecting FDI inflows. Most of the above empirical studies reinforce the argument that the impact of FDI can be positive only if *favourable* conditions are present in host countries. As de Mello (1999: 148) argues, the FDI-growth nexus is sensitive to country-specific factors such as institutions, trade regime, political risk, and policy.

The presence of FDI can also result in other benefits such as increased competition in domestic markets and improved efficiency of domestic firms (Takii, 2005). Another potential benefit from FDI for host countries is that of the transfer of technology. The presence of multinational corporations creates the potential for spillovers of technology to domestic firms. Blomström and Kokko (1994, 1995, 1997, 1998) argue that because MNEs possess proprietary technology, they are more likely to transfer this technology to their affiliates. Other studies (Caves 1974; Findlay 1978; Blomström 1989; Kokko 1994) find evidence of productivity spillovers to local firms at the micro level. For an excellent overview of how FDI affects host countries, see Blomström and Kokko (1997, 1998) whilst Bhagwati (2007) provides an excellent and balanced discussion on the impact of multinational firms in developing countries. In the next section we review the literature on foreign direct investment and the transfer of technology to host countries.

2.4 Foreign Direct Investment and Technology Transfer to Host Countries

In recent decades the issue of how developing countries can acquire the technical, managerial, institutional, and marketing know-how necessary to spur growth and structural transformation so badly needed has become important. Whilst several channels exist for the acquisition of modern technology, foreign direct investment has emerged as probably the easiest and cheapest means by which such superior technology can be transferred from the advanced industrialised countries. For many developing countries, attracting FDI offers several potential benefits, which include financing a savings gap or balance of payments deficit, stimulating exports, increasing employment and the transfer of technology. Of these benefits, the acquisition of modern advanced technology has been touted as instrumental for attaining industrial development and achieving and maintaining international competiveness. As Lall and Narula (2004) argue, the role of MNEs as a source of capital and technology has grown over time, as other sources of capital have become scarcer and more volatile. Further, they also note that MNEs dominate the creation of technology, and with the associated costs and risks, the importance of MNEs in this respect has grown.

The growth of MNE activities has also resulted in "the accelerated diffusion of hard and soft best manufacturing practices across the world" (Schwartz, 1994: 241). And as noted by Blomström (1989) and Blomström and Wolff (1989), FDI through multinational corporations can contribute not only to the diffusion of technology but also bridge the technological difference between advanced and less advanced countries. The important role played by MNE activity in the international transfer of technology is therefore without doubt. In this section we discuss the role of FDI in the transfer of technology to host countries. But before that we briefly review a few of the discussions in the literature on what constitutes technology.

2.4.1 The Meaning of Technology (or Technological Knowledge)

It is widely acknowledged that modern technology plays a very important part in the development process of many countries. Kim and Nelson (2000) for example cite the importance of technological advance in the process of economic growth in the works of Adam Smith, Karl Marx and Joseph Schumpeter. Furthermore, the significant role played by the progressive acquisition and mastering of advance technology in the

growth experience of the newly industrialised economies of East Asia have been noted by Pack and Westphal (1986) and Kim (1997). Porter and Stern (2000) have stressed the importance of knowledge and innovation as important drivers for sustainable, long-term growth. In this brief discussion we aim to explore the various meanings ascribed to technology or technological knowledge in the literature with emphasis on its characteristics.

Despite the important role modern technology plays in the development process, the concept is nebulous.[8] Blomström and Kokko (1997: 3) write that technology 'is an inherently abstract concept, and therefore difficult to observe and evaluate'. Indeed, the term *technology* could be several things to several people, and could be quite intractable if not clearly defined. Freeman and Soete (1997: 14) for instance, note that the term technology "usually carries the implication of a change in the way in which we organise our knowledge about productive techniques". However, over time its modern connotation suggested a more "formal and systematic body of learning".

Moreover, the use of the term technology in microeconomics has come to be associated with the production function, referring to how the inputs are combined to produce a given level output; specifically the decisions regarding what production technique – labour-intensive or capital-intensive – to use. And with the emergence of new growth theory from the early 1980s, the importance of technology has gained prominence especially in regard to growth dynamics. The argument is that technology is characterised by increasing returns, which in turn drives the growth process.

Nonetheless, our understanding of technology broadly revolves around what Freeman and Soete (ibid: 24) describes as "a body of knowledge about techniques" which is frequently "used to encompass both the knowledge itself and the tangible embodiment of that knowledge in an operating system using physical production equipment". This characterisation would suggest that technology or knowledge about things is codified in manuals, available in blueprints, or embedded in capital and other intermediate inputs. But Evenson and Westphal (1995: 2213-2256) argue that, although technology is fundamentally about how to do things, "much of the knowledge about how to perform elementary processes and about how to combine them in efficient ways is tacit, not feasibly embodied and codifiable, and therefore not easily transferable".

[8] We will use the terms knowledge and technology interchangeably in this chapter. Moreover, in the methodology chapter, there is further discussion on technology and a practical definition for our study.

Moreover, they note that there is a false assumption that technology simply consists of a set of discrete techniques, each wholly described by its blueprint, which presupposes that its transfer will be relatively easy. Thus, what is characteristic of the nature of technology is that it is "more complex and learning about it is not costless". Furthermore, developing countries do not obtain industrial technology as freely as "manna from advanced countries".

But there is one important characteristic of technology – its tacitness – highlighted in the literature (Keller 2009; Nelson 2000; Evenson and Westphal 1995; Dosi et al. 1988; Polanyi 1958) that needs further comment. The aspects of technology that are tacit in nature implies those aspects cannot be easily codified into blueprints that can therefore be easily deployed for practical uses; and that only by direct investigation such as engaging in R&D activity in a particular intellectual or technological field can one acquire such tacit knowledge (Griffith et al. 2000). Nelson (1979) cited in (Pack and Westphal 1986: 105), notes that "technology is characterised by a considerable element of tacitness, difficulties in imitation and teaching, and uncertainty regarding what modifications will work and will not". This point illustrates what Arrow (1969: 34) refers to as the "…the inability of the receiver to understand the message" transmitted or transferred, thus making frequent personal contact important. He uses the example of the supply by the British of the plan for the jet engine to the Americans during the World War II to illustrate this last point. According to Arrow, it took 10 months for the plans for the jet engine to be redrawn by the Americans before they could be used by the Americans. An important implication that emerges here regarding the tacit nature of technology is the need for face-to-face interaction, observation, and other forms of deliberate learning in order for certain components of technology to be transmitted effectively. One channel by which this transmission can take place is through the activities of multinational firms in host countries. For an excellent discussion on the challenges in defining technology and the various issues involved in its transfer see (Chen 1996: 181-182; Enos 1989: 2-5), whilst Nelson and Winter (1982: 76-82) present a good discussion on the tacitness of organisation knowledge, especially skills.

2.4.2 Technological Knowledge and the Activities of Multinational Enterprises

One important component of multinational enterprises' activities is the production of knowledge through research and development. Consequently, their possession of superior production and marketing technology in relation to domestic firms places them at an advantage with respect to international economic activities. These firm-specific assets, such as managerial and marketing expertise, also provide them the advantage to operate in several locations around the world. Hymer's (1960) initial thesis on firm-specific advantages of FDI provided the basis for the development of the concept of knowledge capital (Markusen 1995; Markusen and Maskus 2002). Based on this theoretical framework for analysing the activities of multinational enterprises, Markusen and Maskus (2002) argued that the inherent advantage of FDI associated with multinational enterprises was their knowledge capital.

As the World Investment Report 1999 notes, FDI associated with multinational firms consists of a bundle of assets; proprietary assets and non-proprietary. Proprietary assets are the ownership advantages of multinational firms and therefore can only be acquired from them. The most prominent of such assets is technology, although there are others, such as brand names, skills, and the ability to organize and integrate production across countries or to establish marketing networks. On the other hand, there are also non-proprietary assets such as those that can be obtained, at least in part, from the market. These include finance, capital goods, and intermediate inputs (UNCTAD 1999: 316-317). Thus, in terms of multinational firms their most important asset consists of technological knowledge, which broadly defined consists of intangible assets such as brand names, human capital, patents, trademarks and technology. However, these assets inherently reflect the tacitness of technology and knowledge. And as Pack and Westphal (1986) argue the tacitness of knowledge makes some of the elements of technology inherently non-tradable, and which provides multinationals the ability to act as agents for technology transfer.

On the question of tradability of technology, Pack and Westphal (1986) observe that neoclassical economics assumes that technology is perfectly tradable. This conclusion is derived from general equilibrium theory and its assumption that technology is known and by implication is freely available and costlessly assimilated. Although they are in agreement with the assumption that the existence of a particular technology can be known to those who do not possess it, they disagree that knowledge

of the technology somehow translates to its being freely available and that assimilation is therefore costless. For Pack and Westphal (*ibid*), knowledge in a communicable form is distinct from the capability to make effective use of it. And only knowledge that is close by, they point out, is what is known to exist; knowledge that is somewhere in the world cannot exist everywhere simultaneously. Nevertheless, they opine that whilst some elements of technology are inherently non-tradable, there is abundant trade in other elements of technology. The international transactions involving these elements include foreign direct investment, turnkey plant contracts, licencing agreements, and technical assistance contracts. But Caves (1996), Teece (1981) and Blomström and Kokko (1997) have argued that the markets for technology are characterised by several imperfections, not least information asymmetries and the uncertainties regarding use, licences and contracts, which makes the transactions costs for sales of technology to outsiders high.

Furthermore, Lipsey and Sjoholm (2005) identify two issues regarding FDI and technology transfer. The first is whether inward FDI does involve superior technology, and, second, whether it spills over to domestically-owned firms, usually in the form of productivity gains. On the first issue, it is generally accepted that inward FDI does possess superior technology, but mostly in developing country contexts. The presumption has been that foreign-owned firms possess superior technology compared to domestically-owned firms. Given this general acceptance, the second issue has engaged most researchers on FDI and technology transfer, specifically the spillover effects of FDI in host countries. Despite the observation by Lipsey and Sjoholm (2005) regarding FDI possessing superior technology, this may not always be the case. Indeed, it is conceivable that FDI might involve the transfer of technologies that are outmoded in the developed world, and although *new* to the developing world may add little by way of improving productivity in the host country. Such multinational activity may only be exploitative, with very little if any benefit to the host country arising from their presence.

In addition to the activities of multinational firms and their FDI activities, several channels by which technology transfer can take place have been identified. Saggi (2000) distinguishes between two means by which technology spreads across countries. The first is the international trade in technology, whilst the second is a set of indirect channels of international technology transfer via trade in goods and international movement of factors of production, notably capital and labour. Several

authors (Blomström and Kokko 1997, 1998; Thorbecke and Wan Jr. 2004; Akyüz and Gore 2001; Pack and Saggi 2001; Saggi 2002; Tybout 2000; Hausmann and Rodrik 2003; Bigsten and Söderbom 2005; Johnson 2006; Pack 2006; Rivera-Batiz and Oliva 2003; Hall and Helmers 2010) also mention the various modes by which technology transfer can take place from one country or firm to another.

These include publicly available information with limited or no restrictions on its use obtained via education, training, or available in published materials; purchase of new or used machinery and equipment; reverse engineering, imitation, adaptation and learning of internationally available technologies; licencing, which represents an arm's length channel of transfer; hiring of consultants and experts; technical cooperation or joint research activities, between a large corporation or developed country government or agency or research institute and a counterpart in a developing country; trade contracts between firms in the developed countries and firms in developing countries; international joint venture businesses between a foreign firm and a local private/state owned firm; foreign direct investment via backward and forward linkages; turnover of skilled workers and managers who have acquired requisite expertise on the job.

To summarise, the literature distinguishes four main ways by which FDI transfers technology to local firms. These are international technology spillovers, backward linkages, labour turnover, and horizontal linkages. These channels will be discussed in some depth under section 2.5 titled, Modes of Technology Transfer through FDI.

2.4.3 Technology Transfer, Technology Diffusion and Technological Spillovers

In this section we briefly distinguish between the terms *technology transfer*, *technology diffusion* and *technology spillovers*, which are usually associated with the general discussion on FDI as a source of modern technology for host countries. However, it is worth pointing out that in the context of this research *technology transfer* refers to *cross-border transfers of technology*. Nonetheless, this is not the only means by which technology transfer occurs. Technology transfer can be *inter-firm*, such as that within a country between two (domestic and/or foreign) firms, and *intra-firm*, such as that between a parent and a subsidiary (and this could be cross-border or within-country).

These distinctions aside, we note that within the literature on *FDI and technology transfer* the terms technology diffusion and technology transfer are used interchangeably (see for example, Keller, 2004, 2001, 1996; Todo and Miyamoto, 2002; Takii, 2005; Blomström and Kokko, 1997). Furthermore, studies on FDI and technology transfer tend to assess the impact of FDI in terms of spillovers to the domestic economy. Regarding these terms, a distinction between them is necessary to ensure a proper understanding of their usage in the context of this research. Todo and Miyamoto (2002) for example note that the distinction between technology transfer and technology diffusion is that the former implies actions that are *intentional*, whilst the latter include *unintentional activities* relating to the flow of ideas and skills. Hall and Khan (2003: 1) note that "diffusion ... appears as a continuous and rather slow process", and can be regarded as "the cumulative result of a series of individual calculations that weigh the incremental benefits of adopting a new technology against the cost of change, in an environment characterised by uncertainty and limited information".

A more useful distinction between *technology transfer* and *technology diffusion* is provided by Ramanathan (2005). He defines technology diffusion to be the passive "spread of technological knowledge related to a specific innovation of interest within a specific technological population". On the other hand, technology transfer is "a proactive process to disseminate or acquire knowledge, experience and related artifacts". The transfer of technology is "thus intentional, goal-oriented, not free, and would usually suggest an agreement between the parties to the transfer" (Ramanathan 2005: 5. Technology transfer thus involves deliberate effort, such as investments in R&D by firms. Rivera-Batiz and Oliva (2003: 321) for example consider technology transfer activities to include "investments in production of new scientific knowledge and knowledge directed towards a practical application or commercial objective".

This however is not the case with diffusion, where the absorption of knowledge is passive. For an excellent and extensive discussion on technological diffusion, see (Sarkar 1998). Technology transfer therefore involves deliberate efforts by firms to acquire new technology, disseminate for in-firm use, adapt and utilise for productivity gains. This process will however involve acquisition costs and dissemination costs, such as training and other forms of knowledge transmission, which might be necessary for workers to achieve a desired level of production efficiency.

Technological spillovers are externalities arising from the presence of foreign firms in host countries, and are therefore distinct from the deliberate efforts by firms to acquire modern technology. Despite the considerable attention devoted to the question of technology transfer, agreement on a standard measure in empirical studies has proved elusive. This problem probably arises because of the nebulous nature of the term, the complexities involved in the actual transfer process, and the near impossibility of actually observing it in practice. As a result, several empirical studies on FDI as a source of modern technologies to host economies have tended to examine spillover effects instead. Blomström and Kokko (1997) describe spillovers as the costs or benefits arising from the interaction of FDI with domestic firms and institutions in the host country.

Spillovers could be negative, such as when they create distortions in the tax system or create labour market imperfections or reduce welfare. They can also be positive when they generate technological externalities – knowledge spillovers or demonstration effects – for the local economy, or result in forward and backward linkages with domestic firms (Blomström and Kokko 1997; Rodriguez-Clare 1996). Spillovers arise because FDI firms are unable to internalize the full value of their proprietary technology that constitutes their firm-specific advantage (Blomström and Kokko 1997, 1998; Javorcik 2004). Consequently, they share the productivity and efficiency benefits of new technologies with domestic firms. Spillovers are however not always positive. Indeed, negative spillovers arise when domestic firms are forced out of the market or specific industries, experience a reduction in profits or market size, loss of experienced labour to list a few, due to the presence of FDI firms.

For ease of clarity, we intend to use technology transfer to mean international technology transfer, which is the transfer of technology from one country to another, which as we have already noted is often via FDI and the activities of multinational enterprises, such as joint ventures, labour training, introduction of patents, brands, etc. Thus, our use of technology transfer in this research refers to activities carried out by FDI firms and within these firms, as a result of their establishment in Ghana. Technological spillover on the other hand arises when technology is passed on to domestic firms via labour mobility, forward and backward linkages, selling of licences and patents, etc. Thus, technological spillovers, however measured, refer to the benefits that domestic firms receive as a result of technology transfer activities carried out by FDI firms.

But as we have stressed in the previous chapter, and continue to stress in this study, many empirical studies simply assume the process of transfer via FDI and proceed to assess spillover effects on domestic firms. Hence, the originality and contribution of this study is that we do not simply assume that technology transfer takes place via FDI; the objective of the study therefore is to investigate empirically if and how this takes place via FDI in the case of the Ghanaian manufacturing sector. We do not intend therefore to examine the spillover effects on domestic firms as a result of the presence of FDI firms in the manufacturing sector.

2.5 Modes of Technology Transfer and Spillover through Foreign Direct Investment

In this section we briefly summarise the theoretical work on FDI as a channel for the transfer of technology to host countries. There are several analytical approaches that have emerged to explain how modern technology can be transferred to host countries via FDI. A general characteristic of these analytical approaches is that the transfer and spillover of technology arises due to interactions between multinational firms, the host country institutions and domestic firms, although the modes of transfer differ. Furthermore, the modes of transfer and spillover take several forms, which include labour training and mobility, vertical and horizontal linkages, and joint venture relations.

2.5.1 Labour Training and Mobility

Models that emphasise labour training as a channel for the transfer and spillover of technology have been developed by (Wang 1990; Fosfuri et al. 1999; Markusen 2001; Glass and Saggi 2002; Markusen and Trofimenko 2009). In Fosfuri et al. (1999), multinational firms with superior technologies train local workers in the use of modern technologies and in other areas of firm management. Training could span all categories of workers – from production workers to top level managers, and could be general and/or specific on-the-job training. Spillovers arise when workers previously employed and trained by the multinational firm leave to join other domestic firms or set up their own enterprises. Blomström and Kokko (1997, 1998) for example identify the training

of local workers by subsidiaries of MNEs as a channel for technology transfer. Training could take several forms and can take place in-firm, in-country, an overseas education, even at the headquarters of the parent firm. Evidence that multinational firms provide training to workers and are more likely to train workers compared to domestic firms have been presented by Tan and Batra (1996), Zeufack (1999) and Tan and Lopez-Acevedo (2003). They also indicate that training is more likely if multinational firms employ more specialised and advanced technology in production. Miyamoto (2003) also identifies training as one of the major sources of human resource development by multinational firms. It is important to stress here that our emphasis on training is because it is a channel for the transfer of technology by multinational firms, albeit an indirect channel.

In the analytical framework presented by Glass and Saggi (2002), workers acquire knowledge through their exposure to the superior technology in the multinational firm. However, where the multinational firm trains its workers it offers a wage premium to keep them from leaving. In Markusen and Trofimenko (2009) domestic workers acquire knowledge through training provided by foreign experts. The training provided may be strictly specific to firms or may be transferable. The spillover of technology occurs with the physical movement of workers, who have received/have been exposed to technology working in a multinational firm, to other domestic firms within or outside the same industry.[9] However, given the possibility that workers might only remember a proportion of the knowledge acquired, the spillover of technology might be incomplete. Moreover, domestic firms are able to enjoy the benefits of technology spillover if their level of absorptive capacity is relatively high. In other words, domestic firms that are relatively technologically backward are less likely to reap the full benefits of knowledge embedded in workers previously employed by multinational firms.

[9] An important assumption in these frameworks is that the multinational firm is the only firm possessing superior technology.

2.5.2 Forward and Backward Linkages

Another stream of analytical frameworks have looked at forward and backward linkages as another channel by which technology can be transferred from multinational firms to domestic firms (Lall 1980; Rodriguez-Clare 1996; Blomström and Kokko 1997; Markusen and Venables 1999; Pack and Saggi 2001; Lin and Saggi 2005). In these analytical frameworks the emphasis has been on spillover effects rather than technology transfer arising from the presence of multinational firms. Vertical spillovers can be defined in terms of backward and/or forward linkages. Backward linkages occur when domestic suppliers produce intermediate inputs for the multinational firms, whilst forward linkages work the other way round.

In Rodriguez-Clare (1996) and Markusen and Venables (1999) for example, the presence of multinational firms may lead to the generation of backward linkages, thus leading to the production of a greater variety of specialised inputs, and forward linkages, resulting in the production of more complex goods at competitive costs. In both papers the benefits of backward linkages involve the expansion of demand for intermediate inputs, with the potential that industrial development in the host country could be spurred.

In Lin and Saggi (2005) the presence of multinational firms leads to the spillover of technology from the MNE to domestic suppliers of intermediate inputs. Even if the MNE generates backward linkages by sourcing its inputs from local suppliers, it can also transfer technology to these suppliers. The only condition facing local suppliers for receiving new technology is that they exclusively serve only the MNE. The implication is that the technology embodied in these intermediate inputs does not spread to other final goods producers, domestic or foreign.

2.5.3 Demonstration Effects (Horizontal Spillovers)

Demonstration effects (horizontal spillover effects) have also been identified as a means by which domestic firms can acquire new technology from multinational firms (Das 1987; Blomström 1989; Wang and Blomström 1992; Blomström and Kokko 1997; Glass and Saggi 1999). These demonstration effects can also be regarded as horizontal FDI spillovers. Keller (2009: 28) describes horizontal FDI spillovers as occurring when the presence of a multinational affiliate generates "technological learning spillovers to other firms in the industry" through the business operations of the affiliate. Das (1987: 172) describes this process as "learning from watching" suggesting that tacit knowledge may leak out from the multinational firm to local competitors as they seek to emulate the success of the multinational firm. Thus, in the presence of multinational firms, competing domestic firms may become more efficient by adapting or imitating technological innovations of foreign firms, that is, domestic firms imitate the production, management, innovative and marketing technology of foreign firms.

There is no indication from the literature if this type of knowledge is completely and freely available for domestic firms. Nonetheless, domestic firms can only partially benefit through such imitation, given that some of the technology used by foreign firms is tacit in nature. However, the successful spillover of technology from foreign to domestic firms also requires that domestic firms play an important role in the technology transfer process. The effective spillover of technology is dependent on domestic firms investing in learning and other R&D activities. In other words, domestic firms must improve on their absorptive capacity (technological capabilities) to benefit from such spillovers due to the presence of multinational firms.

2.5.4 Mode of Entry of FDI

Another strand of the literature looks at the mode of entry of FDI as channel for the transfer of technology to host countries (Lee and Shy 1992; Mattoo et al. 2004). The mode of entry could be the result of direct entry such as the establishment of a subsidiary or through a joint venture or whole acquisition of a domestic firm by a multinational firm. In Lee and Shy (1992) for example, a joint venture between a multinational firm and a domestic firm allows for technology transfer to occur. However, the transfer of technology is neither costless nor guaranteed. Where

restrictions are imposed by government on the share of foreign participation permitted in any joint venture, technology transfer is low and is associated with the production of old-model, low-tech goods. The implication here is that the greater the ownership share of the foreign investor, the greater the probability of an increase in the quality and amount of modern technology transferred, though the level of output may not increase. Technology transfers are also likely to increase with higher profits for foreign investors. In summary, where the joint venture is controlled by the multinational, an increased share of foreign ownership leads to the transfer of high-technology and consequently the production of high-tech products, provided profits are not affected.

In a further advance on Lee and Shy (1992), Mattoo et al. (2004) develop a framework in which there are two modes of entry for FDI – through acquisition (wholly or joint venture) or through setting up a subsidiary. In addition to the transfer of technology to host countries, domestic markets are expected to become competitive, especially where the multinational sets up a subsidiary. With regard to technology transfer, it is uncertain which mode of entry is likely to result in greater transfers of technology. Nonetheless, it is clear from their analysis that the incentive to transfer technology is dependent on the share of the domestic market enjoyed by the foreign firm. Thus, as the foreign firm enjoys a relatively larger share of the market, it is incentivised to transfer costly technology. Strategic incentives, such as the motivation to wrest market power away from domestic rivals will entice the foreign firm to transfer more technology.

But, as in the case of Lee and Shy (1992), here too the presence of restrictions on the degree of foreign ownership can affect the amount of technology transferred. It however seems that technology transferred, either in the case of a subsidiary or where a domestic firm is acquired by a foreign firm, stays within the foreign firm. There is no clear mechanism for the spillover to other domestic firms. Furthermore, it appears that old-model, low-technology transfers are likely to occur initially, because they have no value in the developed world, from where they were originally developed, and do not present a threat to foreign firms because products produced as a result of low-technology cannot compete in export markets.

2.5.5 Licencing and Technological Gap

Another channel by which modern technology can be transferred from developed to developing countries is via the granting of licences to firms in developing countries to produce specific products for export and/or to serve domestic markets. Several authors discuss the role of licences in the transfer of technology (Teece 1977, 1981; Katz and Shapiro 1985, 1986; Gallini 1984; Gallini and Winter 1985; Gallini and Wright 1990). Further, Horstman and Markusen (1987), Saggi (1996, 1999), and Ethier and Markusen (1996) have analysed the provision of product licences to domestic firms by multinationals as a means by which to serve domestic markets. In this framework the multinationals can choose between providing a licence to produce a new product, exporting directly to host countries or establishing a subsidiary. Where licencing is chosen, the domestic firm in the host country produces for the host market, although it could also produce for exports to the rest of the world. But Horstman and Markusen (1987) have argued that where the licencing option is chosen, two risks emerge; product quality may be compromised and other competitors might acquire the technology.

The technological gap between developed and developing countries has been identified as an important factor determining the type of technology transferred. Glass and Saggi (1998) develop a framework that examines the conditions which will necessitate the transfer of state-of-the-art technology to host countries. They argue that the quality of technology transferred is determined by the technology gap between the developing host country and developed source country. Where the developing country invests in R&D, thus building up its capacity for innovation and imitation, which reduces the technological gap, the quality of technology transferred by FDI is generally advanced.

But the technology gap between the two countries is not entirely dependent on R&D activities in the developing country. It is also affected by R&D activity in the developed country. Thus, for any given product-specific technological knowledge, a wider technological gap between the two countries results in the transfer of outmoded technology to the host countries. In spite of this, Glass and Saggi (1998) suggest that FDI involves the transfer of a ‘better technology’ to developing countries, because the technologies transferred from the advanced countries are those that have been replaced by new, state-of-the-art technologies. In other words, the discarded technologies of the

advanced North are better than the antiquated technologies in the technologically-backward South.

2.5.6 Technology Transfer through Imports of Capital Goods

Another channel of technology transfer that is related to FDI activity is the import of machinery and equipment by subsidiaries of multinationals from their home countries. The global activities of multinational firms also include trade in intermediate inputs and capital equipment. As Fu et al. (2011) observe, capital equipment and other intermediate inputs imported by subsidiaries from their home countries are embedded with new technologies, and products that use these imported machines are expected to be of higher quality. The import of machinery and equipment is not restricted to the subsidiaries of multinationals. Indeed, domestic firms can also acquire new technologies by purchasing machinery and equipment made in technologically advanced countries.

However, Blomström and Kokko (1997, 1998) argue that whilst it is difficult to estimate the technology content in goods trade, evidence from the United Nations Centre on Transnational Corporations (UNCTC) reveals the significant volumes of trade in machinery and equipment between Industrialised countries and developing countries. But given that the bulk of world's spending on research and development takes place in the developed world, it is easy to see why the imports of capital goods and other intermediate inputs by developing countries can be a channel for the transfer of new technologies from the developed to the developing world.

Within the international trade literature, the idea that imported intermediate goods embody technological know-how, which can be acquired through imports, has been explored by (Grossman and Helpman 1991; Rivera-Batiz and Romer 1991; Feenstra et al. 1992; Wang and Blomström 1992; Keller 1996, 1998, 2000, 2001, 2009; Eaton and Kortum 1996; Coe and Helpman 1995; Kokko and Blomström 1995; Westphal 2000; van Pottlesberghe de la Porterie and Lichtenberg 2001; Acharya and Keller 2007; Coe et al. 1997, 2008).

The main strand of thought espoused here is that imports of goods and services that have been developed by trade partners with superior R&D capabilities affect the receiving country's productivity. The innovative activities of firms in the advanced North result in the creation of new technologies, which lead to the production of new, specialised intermediate inputs. These new intermediate inputs are therefore embedded with modern technologies. Consequently, the imports of intermediate inputs and capital equipment by a developing country permit the capture of embedded technology; imports thus serve as an important channel for the international transfer of technology, and as noted by Acharya and Keller (2007) there could also be import-related learning effects.

Nonetheless, for an importing country to benefit fully from the technology content of imported intermediate inputs, it needs to possess its own R&D capacity (Keller 2009). An importing country thus benefits once it has a sufficient level of absorptive capacity, and as Li (2011) shows in the case of Chinese firms, in-house R&D efforts does enhance domestic firms' ability to utilise foreign technology. Westphal (2000) also cautions that the import of capital goods does not simply imply the full and automatic transfer of technology; whilst imports of capital goods is one of the channels for technology transfer to occur, building up technological capability is essential for effective technology transfer.

To summarise, we have noted that the transfer and spillover of technology involves several channels, one of which is foreign direct investment by multinational firms. One of the most important characteristics of multinational firms is their dominance in the production and use of modern, advanced technology in production. This firm-specific characteristic gives them the advantage over domestic firms. The presence of foreign direct investment firms is expected to result in the transfer of modern, advance technology to developing countries. There are several channels for transfer, such as training of local workers, joint ventures, and licencing. In addition, spillovers occur via demonstration and interactions between domestic firms and multinational firms, and labour mobility.

There is no a priori indication of the type of technology to be transferred by multinationals to host countries. However, whilst basic, old and low-level technology may be transferred initially, where foreign firms face fierce domestic competition, there is the likelihood that modern, advance technology may be transferred to wrest market

share away from domestic firms. It is also important to stress that, whilst some of the methods for the spillover of technology may involve very little costs to domestic firms, such as those publicly available, most spillover methods are not costless. This therefore requires domestic firms to improve on their absorptive capacity, such as investing in learning and other forms of worker training, before they can effectively take advantage of new technology.

2.6 Absorptive Capacity and Effective Technology Transfer and Spillover

In the preceding section we noted that an important aspect of the technology transfer and spillover process via FDI is the presence of absorptive capacity in host countries, especially domestic firms. The transfer and spillover of technology from advanced industrial economies to developing economies will be successful if local capabilities in host countries are present. Given that FDI activity takes places within an organisational context, such as firms, the knowledge resources available within such organisations, whether they are affiliates or not, represent the most important aspect for successful technology transfer and spillover. This knowledge base, or what has been termed absorptive capacity, ensures the organisation's ability to use and adapt the new technology effectively. Keller (1996) describes absorptive capacity as the skills built up by domestic workers and managers, which is essential for them to make successful use of foreign technology. The firm's absorptive capacity is thus determined by the level of investments in innovation and imitation. Actions that increase a firm's absorptive capacity may therefore be regarded as efforts to improve the quality of human capital or the skill level available in the firm.

At the national level, the importance of human capital in the relationship between FDI and economic growth has been recognised in several studies (Borensztein et al. 1998; de Mello 1999; Li and Liu 2005), as have other necessary pre-conditions, such as openness (Balasubramanyam et al. 1996). Thorbecke and Wan Jr. (2004) have also emphasised the importance of absorptive capacity in the economic transformation of East Asian countries. They argue for example, that FDI's role in the economic development of the East Asian Newly Industrialised Countries (NICs) through the creation of linkages and spillovers rested on the presence of local absorptive capacities. Thus, the presence of absorptive capacities in host countries represents one of the important pre-conditions that ensure effective technology transfer and spillover occurs.

However, as these studies relied on aggregate data, thus focusing on macro-economic relationships, the concept of absorptive capacity relied on some aggregate measure. Our interest in this section is to explore the importance of absorptive capacity at the micro (firm/organisation) level in the effective transfer and spillover of technology. We may consider absorptive capacity at the firm level to represent the ability of the firm to learn, where it is expected that learning should be easier for the learned.

Investments in learning and training represent one of the means by which absorptive capacity at the firm level can be influenced. Kim (1997) for example suggests that the ability to learn represents an important component in building up technological capability. Technological capability refers to the ability to make effective use of technological knowledge to assimilate, use, adapt, and change existing technologies. And it is this ability that enables organisations to create new technologies and to develop new products and processes in response to the changing economic environment. As Kim argues further, technological capability is however a dynamic process that is a function of the firm's absorptive capacity.

But as Davenport and Prusak (2000) have argued, the knowledge transfer process is made up of transmission and absorption, which therefore requires a change in the behaviour of recipient firms/organisations. This complementary relationship between technologies and absorptive capacity has also been highlighted by (Evenson and Westphal 1995; Pack 1992). Hence with limited absorptive capacity within firms, the spillover process is limited or does not take place at all. Several authors such as (Kim 1997; Wong et al. 1999; Fosfuri et al. 1999; Davenport and Prusak 2000; Xu 2000; Lin et al. 2002; Lall and Narula 2004) have highlighted the inhibiting effect of the lack of absorptive capacity in the transfer of knowledge within firms and the spillover between firms. As Westphal (2000: 7) points out, domestic firms need to improve on their technological capabilities in order to ensure 'efficacious technology transfer'.

Clearly, it is imperative therefore that for effective technology transfer and spillover to take place, firms need to develop their level of absorptive capacity. This therefore indicates that the transfer process and the ability to use technology are non-passive. Griffith et al. (2000) argue that a firm's absorptive capacity is linked directly to its R&D activity. Thus, by actively engaging in R&D in a particular technological field, it becomes easier to understand and assimilate the discoveries of others.

This line of reasoning is similar to that developed earlier by Cohen and Levinthal (1989; 1990) who distinguish between innovation and learning, and stress the importance of developing absorptive capacity in order to benefit from new technology. To them, simply being exposed to new, foreign technology does not imply recipient firms can benefit from these technologies, thus their argument in favour of the need for recipient firms to upgrade their absorptive capacity. They argue further that, whilst the research and development activities of firms generate innovations, it also develops the firm's ability to identify, assimilate, and exploit knowledge from the environment, which they describe as the firm's learning or absorptive capacity. Thus, absorptive capacity does not only encompass the firm's ability to imitate a new process or product innovation, but also involves the ability to exploit outside knowledge. It also represents an important part of the firm's ability to create new knowledge. The implication here is that absorptive capacity is the result of deliberate actions by the firm; it is therefore not a passive outcome for which the firm need not actively pursue.

Evidence from the experiences of East Asian economies reveals the importance of deliberate action to improve absorptive capacity within firms. Several authors (Pack 1992; Dahlman 1992; Dahlman et al. 1987; Thorbecke and Wan Jr. 2004) writing on the experiences of several East Asian countries note that efforts, such as training of the labour force and other learning programmes to ensure that new technologies are not just acquired but well understood, were important in shoring up the level of absorptive capacity in these countries. As Keller (1996) notes a relatively high level of human capital in a country would be beneficial in the acquisition of new technologies. Within firms, Cantwell (1989) notes that domestic firms with relatively high levels of absorptive capacity are more likely to exploit efficiently spillovers arising from technology transfer.

Further evidence on the need by domestic firms to invest in learning and innovation have been pointed out in studies by (Todo and Miyamoto 2002; Blalock and Gertler 2004; Takii 2005), which suggest that a firm's own research and development activity positively affects its ability to benefit from spillovers. Furthermore, Blalock and Gertler (2004) have found that plants with more highly educated employees benefit more from the presence of foreign MNEs. Evidence that domestic firms with relatively high absorptive capacity benefit from spillovers arising from FDI activity has been found in Swiss manufacturing (Ben-Hamida 2007) and in the case of Vietnam (Anwar and Nguyen 2010).

In conclusion, we note that whilst domestic firms may lack the capacity to invest in innovative R&D activities, which result in the introduction of new techniques of production, management and marketing, it is imperative that there exists an internal mechanism that ensures an ability to make use of newly developed technologies. The importance of absorptive capacity within firms is seen in its ability to improve the capacity of firms to recognise, acquire, utilise and adapt new technology to their own circumstances. The development of absorptive capacity is linked to training and learning. But it is also apparent that the ability to learn is related to the level of education, represented in various forms as human and institutional capital available within the firm. Typically, this will be represented by senior to middle-level management personnel, supervisors and workers, with senior management responsible for combining the skills of the various categories of workers with that of physical equipment to produce goods and services. Absorptive capacity will thus encompass the human and institutional capital of the firm, as well as the innovative and learning efforts it undertakes.

2.7 FDI and Technology Transfer and Spillover: A Survey of the Empirical Literature

The empirical investigation into FDI as a channel for technology transfer and spillover has largely been of two forms; case studies and econometric studies. As Pack (2006: 29-33) observes "econometric analyses do not permit a fine-grain analysis of the determinants of firm's evolution" [regarding technology acquisition and use]. The econometric approach, he points out, is in contrast with case studies, which "provide a rich source of evidence on the details of the transfer and absorption process and offer important clues to the type of microeconomic detail that would contribute to deeper understanding of the process". In this regard, both approaches may be seen as "complementary". Finally on the two approaches, he notes that whilst it is "impossible for econometric studies to include many of the subtle insights that have been obtained from exhaustive case studies of firms" the approaches used in case studies preclude the possibility of investigating "the ultimate productivity effect on firms, or on other firms and sectors" of technology acquisition.

Most case studies also involve investing a lot of time at each plant, thus limiting the number of firms that can be studied, and without a sufficiently large sample size results from these studies are not viewed as robust. Moreover, most case studies have assumed that FDI and MNEs involve the international transfer of technology into the host country and focus on how firms absorb new technology via spillover, although a few have documented technology transfer in detail. There is also very little attempt to assess the impact of new technologies on total factor productivity or production costs. For an extensive discussion of the case study literature for countries in Latin America and Asia, see (Pack 2006: 33-44).

The predominance of econometric studies on FDI and technology transfer is evident by a search of the words "FDI and technology transfer" on most websites of the academic journals. In fact, most of the empirical work investigating FDI as a channel of technology transfer and spillover that has been undertaken in the last few decades has concentrated on the spillover effects on domestic firms, relying on data obtained from industrial or manufacturing censuses or surveys. The emphasis on spillovers appears to be grounded on the belief that FDI flows generate positive externalities, not least *knowledge spillovers* that result in an improvement in the productivity and export behaviour of domestic firms. It is also based on the idea that technology consists of tacit elements, which therefore implies that an empirical assessment that relies on observable measures, such as payments for licences, purchase of capital equipment and other intermediate inputs only provides a partial picture of the extent of technology transfer. Finally, the emphasis on spillovers may also be based on the absence of direct measures of technology transfer, hence the use of indirect measures. Keller (2009) classifies these indirect measures into three; (a) inputs (R&D), (b) outputs (patents), and (c) the impact of technology (higher productivity). But these indirect measures relate to technology transfer within the firm. Nonetheless, the belief that spillovers to domestic firms occur via several modes discussed in the theoretical section has informed the emphasis on spillovers as a measure of technology transfer to host countries.

2.7.1 FDI and Horizontal Technological Spillovers

The literature on the horizontal spillover effects on domestic firms from FDI is extensive. The standard approach has been to examine changes in one of several performance measures of domestic firms in a specific industry in which foreign firms are present. Occasionally, others have focused on inter-industry spillovers due to the presence of foreign firms in the host country. Three main measures of spillovers are identified as the most prominent in these studies; total factor productivity and propensity to export of domestic firms, and the wages of workers (of domestic origin) employed by domestic firms. There exists a substantial body of empirical work that have sought to estimate the spillover effects of FDI on domestic firms, although in these studies the emphasis has been to estimate the effect of foreign presence on the productivity of domestic firms within the same industry.

Domestic firms benefit from new technology either because of the interaction between workers and managers from the foreign firms and their counterparts in domestic firms or because of worker turnovers; that is where workers trained by foreign firms leave to work in domestic firms or establish new firms to compete in the same industry. There is however, a presumption that the spillover of technology between foreign firms and domestic firms is usually costless, because domestic firms observe the practices of foreign firms and adapt their practices in order to be competitive. In reality domestic firms often undertake costly activities in order to adapt their production system as a result of foreign presence. One important shortcoming of many of these empirical studies is that there has been very little investigation of how the prior transfer of technology takes place from the foreign firms to the host economy; the assumption being that foreign presence results in technology transfer.

Thus, the original contribution of this study is our emphasis on investigating the prior transfer of technology that takes place via FDI. Hence, our use of a survey complemented with two case studies attempts to explore the extent to which FDI is associated with technology transfer in the case of Ghana. It is evidently obvious that any possible spillovers of technology to domestic firms must depend on the prior transfer of technology by FDI.

Given the large volume of empirical work on spillovers we present a synthesis of the various findings and approaches. The limited empirical work on technology transfer from developed to developing countries focused on the relationship between multinationals and their affiliates. The transfer of new technologies thus takes place between a parent company and its subsidiaries in a host country (Caves 1974; Mansfield and Romeo 1980; Blomström 1989; Kokko 1994). Subsequent empirical work sought to examine the impact of these affiliates on domestic firms, hence the emphasis on technological spillovers. However these spillover effects are only potential, in the sense that this depends on the extent of interactions between affiliates and local firms, and on the dynamics within specific industries and markets. It also depends on the ability of domestic firms to copy new technologies or their ability to adapt to new technologies and ideas (that is, domestic firms' absorptive capacity).

The most favoured approach in most studies on spillover effect is to estimate models with a measure of productivity (in several cases, total factor productivity) as the dependent variable. The explanatory variables include a measure of FDI presence in the industry and other firm-specific measures. Other measures of spillovers include exports of domestic firms and wages of domestic workers employed in domestic firms. Positive spillovers are said to occur if domestic firms' productivity (or whichever measure is used) increase in the presence of FDI, whilst the contrary is said to take place if productivity (or whichever measures is used) declines. The findings from these studies are inconclusive. Rodrik (1999) has lamented on the sobering evidence on positive spillovers arising from the presence of FDI in host countries. Further support for the lamentable inconclusiveness is provided by (Görg and Strobl 2001; Saggi 2002; Görg and Greenaway 2004; Crespo and Fontoura 2007). The existence of positive productivity spillovers have been found in studies by (Rhee and Belot 1989; Blomström and Wolf 1989; Blomström et al. 1994; Blomström and Sjoholm 1999; Sjoholm 1999; Haskel et al. 2002; Takii 2005; Liu 2008).

On the other hand, studies by (Haddad and Harrison 1993; Djankov and Hoekman 2000; Xu 2000; Kinoshita 2001; Lemi 2004; Chudnovsky et al. 2008; Waldkirch and Ofosu 2010) do not find evidence of higher productivity in domestic firms because of foreign firms. In the case of Aitken and Harrison (1997, 1999) they find that foreign presence negatively affects productivity of domestic firms. And as Kokko (1994) notes spillovers are less likely in industries with enclave characteristics, such as in mining and other extractive industries. But an interesting study by Todo and

Miyamoto (2002) suggests that domestic firms can benefit from spillovers only if both the foreign and domestic firms engage in R&D activities or human resource development, or as in the case of Argentina, where Chudnovsky et al. (2008) find that only domestic firms with high absorptive capacities benefited from the presence of multinational firms in an industry. These findings point to the importance of absorptive capacity in the ability of domestic firms to benefit from the spillover of technology from foreign firms. For excellent reviews of the literature on productivity spillovers, (Blomstrom 1992; Blomstrom and Kokko 1995, 1998; Keller 2004, 2009; Smeets 2008; Clark and Highfill 2011) are very good examples.

2.7.2 Technology Spillover via Worker Mobility

Other studies have examined worker mobility as the channel for technology spillover. Poole (2008) finds evidence of positive spillover effect via wages in domestic Brazilian firms through worker mobility. More precisely, the positive spillover effect is defined by the share of former multinational-establishment workers wages in domestic-owned establishment on incumbent domestic-establishment workers' wages. However, these findings are not applicable for all sectors and for all workers. The positive spillover effect is contingent on the skill level of former MNE workers and the absorptive capacity of domestic-establishment workers. The evidence suggests that spillover is best between similarly skilled groups of high-skilled workers. The magnitude of wage spillovers is also sector-specific, and indeed most sectors of the Brazilian economy do not seem to be have benefited from the wage spillover effect of MNE activity.

In a similar research, Görg and Strobl (2005) investigate if spillovers from MNEs occur through worker mobility in Ghana. Using the RPED/GMES dataset they investigate whether the owner of a domestic firm with previous employment in a MNE affects firm productivity. Their findings show that firms in the same industry run by owners with previous employment at a MNE were more productive than other domestic firms. However, this productivity effect diminishes for highly skilled entrepreneurs; moreover knowledge spillovers appear to be industry specific. In other specifications, they find that firms run by owners with previous employment in foreign enterprises were less productive than other domestic firms. This certainly reveals a weak case of

productivity spillovers via worker mobility. This finding may also reflect the possibility that these previous employees of MNEs were actually not suitable to the regime in these MNEs and thus sacked. Consequently, one may expect firms run by them to be less productive compared to other domestic firms.

Evidence of technology transfer through labour mobility is limited, and it indicates an absence of significant movements of workers from MNEs to domestic firms. Gerschenberg (1987) in a study on Kenya found that a much smaller proportion of managers trained in multinational firms move on to other domestic firms. This is contrary to what (Pack 1983) finds in the case of Taiwan, where managers trained by MNEs leave to establish their own businesses, suggesting that labour mobility, especially of senior managers serves as a channel for the spread of technology to the rest of the economy. A similar finding is made by (Bloom 1992) in the case of South Korea, where production managers left foreign subsidiaries and joint ventures to join domestic Korean firms, thus bringing with them their expertise. Other studies (Katz 1987; Hall and Khan 2003) also present cases where multinational firms have trained managers and workers who have gone on to start new enterprises.

2.7.3 Vertical Technology Spillovers

A few studies have attempted to examine the possibility that technology spillovers that might occur through vertical linkages – backward or forward linkages – between multinational firms and domestic firms. Using a combination of enterprise survey data and historical company accounts, Javorcik and Spatareanu (2009) present findings of vertical spillovers from the Czech Republic. Based on the relationship between MNEs and their local Czech suppliers, they find that local suppliers of MNEs are more productive. They also find evidence that suggests that suppliers learn from MNEs because of this relationship. Similar studies based on micro-level firm data, such as those by (Blalock and Gertler 2004; Javorcik 2004; Javorcik and Spatareanu 2008) have found evidence of positive vertical spillovers between foreign firms and downstream domestic firms.

2.7.4 Technology Transfer via FDI and On the Job-Training

The importance of on-the-job training or apprenticeships as a means of transferring knowledge especially tacit knowledge has been articulated by Dosi et al. (1988: 224). They note that some aspects of knowledge are well articulated and written down in considerable detail in manuals and articles and taught in school. However, others that are largely tacit are learned through practice, such as through training and apprenticeship. Several studies have shown that foreign firms initiate more on-the-job training programmes than their domestic counterparts (Edfelt 1975; Gonclaves 1986).

However, Lall (2003) in a study of FDI in Lesotho's manufacturing sector finds that although FDI firms have created new skills by providing on-the-job training, this is limited to knowledge of the basic production requirement. At the top management level, there is heavy reliance on expatriate staff in supervisory, technical and managerial positions indicating the absence of any possibility of the permanent transfer of more advanced production, management and marketing knowledge. Moreover, there was no well-developed training of local workers and no transfer of technology. Indeed, he finds that most workers are taught to use only one machine, with no training in machine maintenance, layout, pattern making and other skills. Only one firm had in-house training programme for supervisors.

2.7.5 The Intellectual Property Regime and Technology Transfer through FDI

We have earlier discussed licensing as one of the channels by which technology transfer might occur between a multinational firm and a domestic firm. However as Horstman and Markusen (1987) note there are potential risks involved, especially the threat from other competitors who might imitate the technology. The presence of an effective intellectual property rights regime in host countries therefore serves as a guarantor for MNEs wary of the likelihood of competitors imitating their technology. The importance of effective intellectual property protection is underscored by Hall and Helmers (2010), who have observed that one overriding risk for foreign firms in the transfer of technology is the threat to their profits from local firms who can imitate their technologies. Thus, the presence of enforceable intellectual property rights is likely to encourage the transfer of technology, especially the very sensitive and high-technology type. Nonetheless, they acknowledge that the risk of imitation in cases of advanced

technology is highest when the host country has the capacity to adopt and develop such technology. For further discussion on the role of intellectual property rights and FDI flows, see Hall and Helmers (2010: 10-12), whilst Maskus (2000) offers a detailed examination of the issue in a much broader context.

Mansfield (1994) presents one of the first studies of technology transfer through foreign direct investment. Based on a study of 94 US firms involving the use of survey data, interviews and statistical analysis, he examines the extent to which the degree of intellectual property protection in host countries influences the decision of US firms to transfer technology to 16 countries, many of which were developing countries.[10] His study found that the strength or weakness of a country's system of intellectual protection has a significant impact on the degree of technology transfer especially in high-technology industries (see Hall and Helmers, 2010 on the importance of an effective intellectual property regime in the transfer of technology). For example, in the case of firms investing in sales and outlets, only 20 percent indicated that intellectual protection was important in their decision to transfer technology. As the level of technological requirements in production increased, the number of firms reporting that the strength of a country's intellectual protection system was important increased. For instance, for firms engaged in the manufacture of components or complete goods, about 50–60 percent indicated it was important, while for those investing in R&D facilities, this increased to 80 percent. In a similar study Mansfield (1995) extends the sample to include Japanese and German firm and reaches the same conclusions regarding the influence of the perceived strength or weakness of intellectual property protection on the amount and kinds of technology transferred by Japanese, German and US firms in developing countries.

In a latter study, which employs the least squares approach, Lee and Mansfield (1996) examine the relationship between a country's system of intellectual property protection and the volume and composition of US FDI in that country. Their findings confirm the proposition that a country's system of intellectual property protection influences the volume and composition of US foreign direct investment. They find that the volume of FDI varies with the perceived strength of intellectual property protection in host countries by US firms. On the other hand, Kim (2003) arrives at a slightly

[10] The actual number of firms was 100, however complete or partial information was obtained from 94 of the firms. The countries are Argentina, Brazil, Chile, Hong Kong, India, Indonesia, Japan, Mexico, Nigeria, Philippines, Singapore, Republic of Korea, Spain, Thailand, Venezuela and Taiwan, China.

nuanced conclusion in relation to the effect of intellectual property in the case of Korean businesses. Although he notes the importance of intellectual property rights regime in host countries, he argues that for developing countries, having a very strong regime might not necessarily result in the transfer of technology. Other factors, such as the level of economic development and the level of technological development in production (absorptive capacity at the national level) are important, probably more important than the presence of a strong intellectual property regime.

2.8 Summary

In this chapter we began with a review of the literature on the theories of FDI noting how the discussion on FDI evolved from traditional trade theories, to the work by theorists working on the internalisation theory. This provided the analytical foundations for what became known as the 'new trade theory' in which the activities of multinational firms were explored further. We also briefly reviewed the literature on FDI in the SSA context noting that the emphasis of researchers has been to find out the factors that explain FDI inflows to the region. Further, we examined the literature on the benefits of FDI to developing countries, noting how the views on FDI by academics and policy makers had evolved from being hostile and sceptical towards FDI, to one in which there is now active encouragement of FDI to the region. The literature now emphasises the numerous benefits that host countries can derive from FDI, although FDI may also involve costs to host countries.

We also reviewed the theoretical literature on FDI and technology transfer and spillover. We identified several modes of by which technology embodied in FDI may be transferred to host countries and spillover to domestic firms in host countries. The main channels identified in the literature include backward and forward linkages, horizontal spillovers arising from the presence of foreign firms in a particular industry, licencing of product or process technology, training of employees in multinationals and labour mobility, and imports of capital and intermediate goods by firms operating in the host country. Our review also revealed that despite the important role played by FDI in technology transfer and spillover, these required domestic firms and/or host nations to have a sufficient level of absorptive capacity. The presence of absorptive capacity in host countries permits the easy assimilation, adaptation, and use of new technologies. In the absence of absorptive capacity the benefits of FDI, especially in respect of

technology may be non-existent. Moreover, it is also likely that FDI will result in the transfer and spillover of out-of-date technologies.

Finally, we reviewed the empirical literature on FDI and technology transfer and spillover. We found that there were two empirical approaches – case studies and econometric studies – that could be used in examining whether FDI serves as a channel for the transfer of technology to host developing countries and its spillover. The case study approach appears very limited, whilst the econometric approach has become the most predominant method. The econometric approach relies on cross-sectional or panel data sets obtained from surveys and censuses of the manufacturing sector in a country. We found that most of the empirical work simply assumes that FDI and MNEs transfer technology to the host country and focus instead on the effects of its spillover to domestic firms. The originality of this thesis is that it focuses on the former in the context of Ghana.

There are several methods that are employed in the econometric approach. Some studies examine technology spillover via vertical linkages, that is backward and forward linkages between domestic and foreign firms, others look at the mobility of workers who had previous employment in a foreign firm. Nevertheless, most of the empirical literature is dominated by studies on exploring horizontal spillovers arising from the presence of FDI in a particular industry. The dominance of horizontal spillover studies is partly the result of the difficulties in observing and measuring the technology transfer process. Technological spillovers are usually measured with productivity indicators, exporting behaviour or labour wages of domestic firms.

The survey of empirical literature, especially those on spillovers reveals varying results and methods across countries. In spite of the significant number of countries for which the spillover impacts of FDI have been explored, there appears to be no conclusive result regarding whether the impact is positive or otherwise. Whilst a large number of studies point to positive impacts, a significant number also reveal negative outcomes. But these conflicting outcomes are the result of the different conditions prevailing in each country. These conditions include the level of education of the workforce, the nature of the intellectual property regime, the level of industrial and economic development, the market conditions in which FDI firms operate, and motivation behind any foreign investment.

What is however clear from the literature review is that investigating the channels by which FDI leads to the transfer and spillover of technology is complex on several fronts. Indeed, whilst it is generally believed that FDI possesses superior technology, this remains to be empirically determined in every context. It is possible that the technology employed by an FDI firm may be new to the environment but not superior; it may be outdated and of little relevance to the host country. This uncertainty regarding the nature of technology and whether its transfer is actually occurring because of FDI activity underlies the principal motivation behind this thesis. It is in this regard, that this study contributes to the burgeoning literature on FDI and technology transfer and spillover by providing insights into the transfer of technology arising from FDI in Ghana's manufacturing sector.

Chapter 3

Foreign Direct Investment in Ghana: Analyses of Policies, Trends and Sectoral Patterns

3.0 Introduction

The history of foreign involvement in the social, political and economic landscape of Ghana predates independence in March 1957. The first recorded contacts with foreigners (mainly Europeans) can be traced to as far back as the last decade of the 15th century, when Portuguese explorers landed on the shores of territory that was later to be termed the Gold Coast, because of the abundance of and trade in gold and other precious metals by the indigenous people. In the years and decades that followed, the Dutch, Danes, Germans and British began to build trading posts, forts and castles to facilitate trade between Ghana and the rest of the world. After several wars and a series of trading deals, the British eventually annexed the country and made it part of her colonies. Thus by 1902 the territory which is now Ghana became part of the British Empire, and thus a colony of Britain. The early European settlers made some investments in infrastructure, such as railways, roads, forts, and mines, but these were largely to facilitate trade and the administration of the country. The importance of Ghana to the trading activities of the major European countries at the time is captured by Gocking (2005: 26), who reports that of the roughly "110 fortifications that Europeans erected on the coast of West Africa, about 100 of them were located on the Gold Coast". In respect of commercial foreign investment activities in Ghana data are unfortunately hard to come by for this early period, and where they exist they are very dated thus rendering any information from this period unreliable for our present purposes.

In contemporary times, the issue of foreign capital and its role in the economic development of countries has fuelled passionate debates among economists, policy makers and members of civil society (Prasad et al. 2007) and the policy events in Ghana in the immediate years after independence in 1957 were no exception. As

Gocking (2005: 119-120) recounts, Professor Arthur Lewis (appointed as economic advisor to independent Ghana by Dr. Nkrumah, Ghana's first Prime Minister and subsequently its first President) had advocated for a policy encouraging "the participation of foreign public and private investment" in the Ghanaian economy. The principal argument behind this advocacy is that foreign capital will act as a spur to the industrialisation programme that had already commenced and therefore facilitate rapid economic growth. Although some of the possible economic benefits of foreign investments – a channel for the transfer of advanced technologies and potential spillovers to domestic firms – were not directly stated, these were implicit in the policy advice by Lewis to the government.

Thus, in spite of Ghana being a socialist state at the time, the government initially went out of its way to encourage foreign capitalist investment. In this regard, consultants from the United States of America were engaged on the programme to encourage foreign investment in order to provide assurances to potential investors that Ghana was safe for foreign investors. Furthermore, other incentives such as guaranteed tax holidays and reduced corporate taxes were offered to foreign companies willing to invest in Ghana. But as well will later find out the policy regime changed over the course of several decades, largely on account of the changing political landscape that occurred during those years.

In this chapter we begin with a discussion on the evolution of official government policy on inward foreign direct investment (FDI) to Ghana.[11] The objective will be to trace the developments in official policy on foreign investments dating from the early 1950s and also noting how these have been influenced by the political landscape. This approach permits us to draw relevant inferences on how policy changes have shaped the patterns of inward foreign direct investment to Ghana. This is not to attempt to explain fully the factors that influence inflows of foreign direct investment to Ghana, but to link policies with patterns of FDI inflows. Hence it represents an alternative to the standard econometric method of regressing a measure of inward FDI inflows to a set of explanatory variables including a policy dummy.

[11] Government policy on foreign investment has mainly been manifest in the form of legislation; hence the discussion of policies in essence is a discussion of the several laws that were passed to govern the activities of foreign investments.

In addition to the general discussion on government policy on foreign investment to the non-extractive sectors, we also examine the various policies towards the extractive industries (particularly the mining sector), given that it is one of the major sectors of the economy. The analysis on the mining sector will be relatively brief. Subsequently, we undertake an analysis of the patterns of foreign direct investment (FDI) in Ghana, first focusing on overall trends of inward FDI since independence and outward FDI. Secondly, we will examine the patterns of inward FDI in terms of the sectoral allocation of investments especially in the non-mining sector. In the next section we begin with a discussion of investment policies on foreign direct investment.

3.1 Early Developments in Foreign Direct Investment Policy – The Nkrumah Years (1951 – 1966)

After independence in March 1957, the Nkrumah administration committed itself to a rapid transformation of the economy, which still bore much of its colonial characteristics; the economy was dominated by agricultural activities, was predominantly rural, an open economy heavily dependent on international trade – exporting cocoa, gold, timber and other minerals and importing consumer goods and capital equipment. Killick (2010: 3) described the structure of the economy at the time as one in which "traditional, labour-intensive production techniques" coexisted with "modern, capital-intensive ones, such as manufacturing, mining and construction". But the manufacturing sector was relatively small in comparison to the rest of the economy. Its contribution to GDP represented less than 3 percent of GDP from 1955 to 1961. Against this background the Nkrumah administration started the implementation of a rapid, state-led long-term modernisation strategy based on import-substitution industrialisation, and the modernisation of the social and economic infrastructure under the Seven-Year Development Plan (Killick 2010; Hutchful 2002; Frimpong-Ansah 1991; Huq 1989). Although the massive industrialisation drive involved heavy state participation and involvement, Donkor (1997) points out that this was not achieved through nationalisation of existing industries, but the creation of new ones.

The post-independence official policy on foreign direct investment in Ghana has been closely associated with the industrialisation drive, which started in the early 1960s. However, attempts to encourage the involvement of foreign investors in the

economic development of the country had begun before independence.[12] As part of the new government's development plan, Grayson (1971: 10) notes that the new administration committed itself to the objectives of the Industrial Development Corporation (IDC) set up in 1947 to "secure the investigation, formulation and carrying out of projects for developing industries in the Gold Coast". The IDC did virtually all government investing in manufacturing by giving small loans to individual proprietors and industries until its liquidation in 1962 (Grayson 1974). By then it had 22 fully-owned and 9 jointly-owned companies (Grayson 1971), which were in matches, metals, furniture, timber, paint, distilling industries, among others (Grayson 1974). These joint-venture companies involved Government and European (mainly British) investors. Nonetheless, the activities of the IDC in the establishment of manufacturing enterprises would seem to suggest that the industrialisation process was entirely a government-financed programme; although Killick (2010) notes that the government had taken the view that these state enterprises were to be sold to private operators when they had become viable.

The pattern of industrialisation in Ghana was different from that of countries in Latin America, the Middle East and the Far East, in that "most of the funding for industries (other than state-owned) was carried out by expatriates rather than indigenous people" (Hakam, 1972: 6). The Nkrumah government did little to encourage private Ghanaian business despite the conscious efforts to attract foreign investors (Donkor, 1997). But Killick (2010) argues that this was a reflection of the lack of indigenous entrepreneurial capacity to drive the industrialisation process at the pace Nkrumah wanted. Moreover, he notes that the lack of support for indigenous capitalists by the Nkrumah government was also motivated by the desire to foster the socialist agenda (of Nkrumah) and diminish the threat posed by wealthy and powerful indigenous businessmen to his political authority.

Consequently, the policy on industrial development restricted Ghanaian private businesses to small-scale concerns provided they were not fronting for foreign partners. This strategy thus sets the stage for the dominance of foreign investors, mainly from Europe, India and the Middle East, in the modern, industrial sector consisting of

[12] The march to independence began in 1951 when the Gold Coast (now Ghana) became self-governing with Kwame Nkrumah elected prime minister of a government formed by his Convention People's Party (CPP). The new African-majority administration committed itself to implementing the existing Ten-Year Development Plan (1946 – 1956) although it aimed to achieve that in five years, with an emphasis on the economic and productive services (Huq 1989).

medium- to large-scale enterprises, whilst Ghanaian businesses were dominant in the low-skill, labour-intensive, and relatively small-scale industrial activities.

In the subsequent sub-sections, we trace the development of government policy on foreign direct investment. Government policy, as already noted, was usually in the form of legislation, which provided the necessary guidelines and legal framework governing economic activities of foreign investors in specific sectors of the economy. In our analysis we only emphasise the legislation that influenced foreign investor activities in Ghana.

3.1.1 The Lewis Report (1953)

The earliest and probably first mention of the need to attract foreign capital is discussed by Lewis (1953) in his report titled *Industrialisation and the Gold Coast*. This report was commissioned by the Government of the Gold Coast under the Prime Minister Dr. Kwame Nkrumah, who later led Ghana to independence in March 1957. The Lewis Report as it was subsequently termed outlined the strategies that must be adopted by the government in order to realise the dream of the Prime Minister for Ghana's rapid industrialisation. It argued that foreign capital represented the most favourably means to attain this goal given the capital constraint faced by the country. Despite the report's recognition of the unpopularity (at the time) and potential disadvantages of foreign investors in a fragile and developing economy, such as Ghana's, it also strongly argued for the participation of foreigners in the industrialisation process.

Moreover, the report argued that even if the government could muster all the financial requirements for its industrialisation programme, it would be impossible to proceed without the knowledge that was only possessed by foreign entrepreneurs; this knowledge the report noted represented a very essential ingredient in the process of industrialisation for Ghana. In other words, the report stressed what in recent years has been recognised as an important element of FDI, that is, the technological knowledge manifest in the form of managerial experience, new techniques of production, commercial experience, and training of labour. Furthermore, the report recognised the need for government to create an enabling investment environment for foreign investors. The report thus stressed the need for the government to state clearly the terms

under which foreign capital would be acceptable, announce these terms definitely and abide by them. The important conclusion from this report was that the success of the industrialisation programme has to depend on foreign capital.

3.1.2 The Pioneer Industries and Companies Act, 1959, 1960, and 1962

The Pioneer Industries and Companies Act, 1959 (later amended in 1960 as Act 28 and again in 1962 as Act 98) was passed to make provision for the establishment of certain industries and companies as pioneer industries or pioneer companies. The Act defined a pioneer industry or company as "an industry not being carried on in Ghana on a scale adequate to the economic needs of Ghana" but "deemed to have favourable prospects for further development". Moreover, to qualify for a pioneer industry or company status, companies making applications must be *incorporated and resident in Ghana* later changed to *incorporated in Ghana* thus relaxing the restrictive nature of being resident in Ghana or by implication a resident Ghanaian. In addition, the legislation provided for new incentives, such as a tax holiday for a period not less than 5 years and not exceeding 10 years commencing from the date of production of the company.

It is important to situate the new legislation in the context of the Second Development Plan 1959-64, which constituted the second part of the original Ten Year Development Plan 1946-56. According to Huq (1989: 128), the Second Development Plan, which was later to be abandoned, expressed the desire of the government to "promoting the establishment of not less than 600 factories of varying sizes producing a range of 100 different products" within a five year period. Clearly this indicated a desire to purse aggressive industrialisation at a scale which would require not just state investments but also foreign investments given that the indigenous capitalist class was not well developed.

It is however important to emphasise that no mention is made of foreign investors in the legislation. However it can loosely be argued that based on the wording of the Act that *an industry not being carried on in Ghana on a scale adequate to the economic needs of Ghana*, a company wishing to take advantage of this Act and not resident in Ghana may have to locate and be incorporated in Ghana. The implication here is one in which multinational enterprises may have to set up subsidiaries in order

to operate on the scale prescribed by the law. Given that very few domestic investors could invest on the scale necessary to fulfil the needs of Ghana, this relaxation in the wording of the residency requirement in subsequent amendments to the law was therefore an implicit admission of the need for foreign investors.

Again, we argue that the introduction of fiscal incentives in the amendments to the Act suggested the need to create an environment that was conducive for foreign investors. Indeed, given the level and scale of domestic industrial development at the time, it was only conceivable that large scale foreign investments represented probably the only means by which any industry or company could potentially contribute to economic development. Moreover, it was only by operating on a large-scale that any industry or company could satisfy the condition of operating in Ghana on a scale adequate to the economic needs of the country. Whilst these inferences could be drawn, it is worth emphasising again that the Act did not explicitly state as part of its objectives efforts at attracting foreign direct investment.

3.1.3 The Capital Investment Act, 1963 and 1965

The Capital Investments Act, 1963 (Act 172), later amended in 1965 as Act 267, undoubtedly represented the first legislation to state specifically that its purpose was to encourage foreign direct investment in Ghana.[13] This new emphasis clearly contrasts with the previous legislation, which lacked an explicit bias toward FDI. Thus, by this new legislation, it became apparent that government's intention had changed, and there was renewed emphasis and greater efforts aimed at ensuring the pride of place for foreign capital in the developmental process of Ghana. The new legislation also resulted in the establishment of an important institution, the Capital Investments Board (CIB). The CIB was, among other things, tasked to "initiate and organise activities for the encouragement of investment of foreign capital" and to ensure that an atmosphere conducive for their smooth operations were in place. The CIB thus represents the antecedent to the now existing Ghana Investment and Promotion Centre.

[13] The introduction of this Act led to the repeal of the Pioneer Industries and Companies Act (1959, 1960, and 1962).

It appears that the rationale behind this legislation included the expectation that such foreign investments would contribute to the development of the productive capacity of the country, strengthening of the balance of payments through export growth and import decline, and importantly the transfer of skills to Ghanaians employed in such establishments. The latter was to be achieved through training, which was to be targeted at Ghanaian workers who were in administrative, technical, and managerial positions. Clearly this new legislation had grasped within it the important benefits of foreign direct investment, and had spelt out how some of these benefits could be harnessed.

In an explicit bid to encourage foreign investments, the law provided guarantees against state expropriation and set out clearly what remedies were available to foreign investors should this happen. There were also no restrictions placed on capital transfers, repatriation of profits and other forms of transfer payments such as interest payments on loans contracted outside Ghana and remittances by expatriate employees to their home countries. In addition, the law provided for income tax holidays not less than 5 years and not exceeding 10 years, capital allowances in respect of buildings, plant, machinery, etc., protection against double taxation, and exemptions from taxes and duties on imports and exports relating to the project. These incentives were intended to serve as enticements for foreign investors to make substantial investments in Ghana with the ultimate aim of accelerating the pace of industrialisation and economic development.

It is however relevant to point out that the enactment of this legislation occurred during the Seven Year Development Plan (7YP) 1963/64 – 1969/70. As Huq (1989) notes, the new development plan was more emphatic on industrialisation, founded on import-substitution industrialisation, and with the stated objective of increasing industrial output by 83 percent by 1970. Industries were thus to be established to process agricultural and mineral products that were exported in unprocessed form. But as Killick (2010: 42) argues, the 7YP was intended to increase the participation of the state in the productive and distributive systems of the economy, which was in line with the thinking of Nkrumah's socialist ideology. Nkrumah is quoted as describing the new development policy as "the complete ownership of the economy by the state" and that "our ideas of socialism can coexist with private enterprise".

But despite the provisions of the law, (Killick *ibid*) reports that the government was hostile to what it considered neo-colonial foreign domination, and therefore frustrated the private sector by depriving it of essential inputs and the use of exchange controls to restrict the repatriation of profits. At best, the government's policy appeared to be ambivalent to foreign investors; in one respect the government appeared to be encouraging FDI because of the need for much needed technological knowledge, whilst in another respect attaching special conditions on their operations, such as foreign investors giving the government the first option to buy their shares whenever the investors intended to sell all or part of them, and that wholly-owned foreign enterprises and joint enterprises between the state and foreign investors be required to reinvest 60 percent of their net profits in Ghana. It is apparent that foreign investors were unlikely to be impressed by the guarantees enshrined in law in the face of such ambivalence in FDI policy and political rhetoric from the government.

3.2 Later Developments in Foreign Direct Investment Policy - The Post Nkrumah Years (1966 – 1995)

In February 1966 the Nkrumah government was overthrown by officers from the Ghana Military and Ghana Police Service, forming the National Liberation Council (NLC) government. The NLC government, according to Frimpong-Ansah (1991), were not driven by any ideology in the same way that Nkrumah had previously. Nonetheless, they "proceeded to quickly dismantle uneconomic and irrelevant state commercial and industrial activities" (*ibid: 99*), with the intent to "restore *efficiency* to the economy" (Killick 2010: 60). In contrast with Nkrumah's socialist agenda of active state involvement in economic activities, the NLC government, which was later to be succeeded by the Progress Party (PP) government of Dr. Busia pursued a cautious liberalisation programme with support from the IMF and placed more emphasis on the involvement of the private sector, especially Ghanaian.[14] A few state-owned enterprises were sold to Ghanaian and non-Ghanaian companies, the latter in joint-ventures with the state. The Ghana Industrial Holding Company (GIHOC) was also established to improve the economic performance of the remaining state enterprises (Killick 2010; Hutchful 2002; Frimpong-Ansah *ibid*). The period of the NLC and PP saw the

[14] The NLC government was in power from February 1966 to October 1969, whilst the PP government lasted from October 1969 to January 1972.

implementation of two development plans; the Two-Year Development Plan from mid-1968 to mid-1971, and the One-Year Development Plan from mid-1970 to mid-1971. Both development plans were critical of the industrialisation programme of Nkrumah and emphasised the development of the private sector (Huq 1989).

In January 1972 the National Redemption Council (NRC) government overthrew the PP government. The coup d'état by NRC was due in part to the consequences of the PP's economic policies. Thus, the NRC set itself to reverse some of these policies, proclaiming to "pursue socialist-style policies of seizing the commanding heights of the economy" (Frimpong-Ansah 1991: 108). Moreover, the policy of privatisation pursued post-Nkrumah was to be reversed through the nationalisation of large mining companies under foreign control (Petchenkine 1993). Against this background, the Capital Investments Decree was introduced in 1973.

3.2.1 The Capital Investments Decree, 1973 (NRC Decree 141)

The Capital Investments Decree, 1973 did not drastically alter the general direction of policy regarding foreign investment. Certain provisions in the previous legislation, such as, protection of foreign investments against expropriation by the Government, and where any expropriation took place, the payment of adequate compensation or resolution via the international settlements scheme were all maintained. The Capital Investments Board (CIB) was also maintained, although its mandate was extended to include the pursuit of other activities. The CIB had to undertake activities such as organising conferences and seminars for the stimulation of investments and to provide for the creation of certain conditions such as industrial estates and industrial processing free zones. In addition, it was also charged with disseminating information about investment opportunities in Ghana. We argue that these additional responsibilities to be undertaken by the CIB represented a very bold attempt to attract FDI to Ghana especially in respect of the development of industrial estates and industrial processing zones.

A raft of other incentives was also available for foreign investors. In the case of labour-intensive investments there was an employment tax credit for a period not exceeding ten years, whilst a five-year income tax holiday applied to capital-intensive investments. There were also generous capital allowances such as 100 percent

exemptions in import duty on plant and machinery, buildings and structures that were linked to the investment project. Other exemptions included up to 100 percent for exports and excise duties and sales tax. The maximum duration for these exemptions was ten years.

In addition, there were certain criteria that foreign investments had to satisfy before being considered by the CIB. For the purposes of this research, three very important criteria are highlighted. Firstly, foreign investments had to ensure the development of the productive capacity of the country and the efficient utilisation of resources. Secondly, investments must result in the efficient saving on imports and the increase in exports in order to assist in improving the country's balance of payments position. It therefore was very significant that a link between foreign direct investment and export promotion was recognised in the Decree. The third point relates to knowledge transfer; investment projects were expected to result in the 'impartation of technical skills to local employees'. On this third point, it is evident that the expectation was for foreign direct investment to result in the skill upgrade of workers and the transfer of modern technology and management techniques.

However, whilst the legislation appears to promote FDI, it is set against a government development agenda that sees the state as 'seizing the commanding heights of the economy'. This clearly results in tensions between the assurances provided in legislation regarding FDI and the posture and commitment of government to a development strategy that considers the state as paramount. The situation became worse when Ghana began to experience difficulties with external creditors after the unilateral repudiation of medium-term external debt, domestic recession and inflation, and a worsening balance of payments situation (Hutchful *ibid*; Frimpong-Ansah *ibid*).

In January 1975, after three years of the NRC government – later reconstituted as the Supreme Military Council (SMC) – a document titled Guidance for the Five-Year Plan 1975–1980 was published. Like the 7YP the Five-Year Plan (5YP) envisaged a greater participation by the State in direct production, which aimed to build an independent economy through a policy of self-reliance, with the implication that a policy of protectionism was to be pursued. The policy of import-substitution industrialisation was again to be pursued and growth in the manufacturing sector was viewed as the driver for economic transformation (Huq *ibid*; Petchenkine *ibid*). The Investment Policy Decree, 1973 was changed in 1975 to reflect the new direction of

government in its drive to achieve greater self-reliance and reduce the influence of foreign investors in the economy.

3.2.2 Investment Policy Decree, 1975 (NRC Decree 329)

The Investment Policy Decree, 1975 was significant in that it effectively set in motion a new wave of increased participation in almost every sector of the economy by Ghanaians and the state.[15] In some respects this could be described as a reversal of previous policies to encourage foreign investments in Ghana. The decree in part indicates that "… the policy requires the use of the legislative power of the State to capture the commanding heights of the economy and sustain its growth". Although the new Decree was to take effect from January 1, 1976, it had clearly indicated the new direction of policy towards FDI. It obviously represented a reversal of efforts to encourage foreign investment by previous legislation, and the effect of this law as we will later in this chapter was the flight of capital out of Ghana in 1976.

The law restricted the retail and wholesale sectors of the economy exclusively for Ghanaians. Foreigners could only take part in any of these sectors only if Ghanaians owned at least 50 percent of capital. Similarly, with regard to commerce and industry foreigners could only partake if Ghanaians owned at least 50 percent of capital. This minimum capital requirement condition also applied in the case of enterprises producing what the law terms basic necessities. These included sugar, salt, soap, detergents, fertilisers, petroleum products, lubricants, machetes, hoes and other manual agricultural implements, animal feed, milk, baby food, textiles, matches, beer, cement, rubber, tyres and tubes and flour. In the banking, timber and mineral industries, foreigners could participate only if Ghanaians owned at least 40 percent of capital.

Moreover, an additional restriction imposed on the timber industry meant the State had to own at least 40 percent of capital in the case of new enterprises that were to be established after 31st December 1975. In a similar vein, new enterprises that were established in the mining sector were required to be partly owned by the State. The state had to own at least 50 percent of capital, whilst for those engaged in the extraction

[15] There were several amendments made to the Investment Policy Decree, 1975. These were Investment Policy (Amendment) Decree, 1975 (SMC Decree 6); Investment Policy (Amendment) Decree, 1976 (SMC Decree 30); Investment Policy (Amendment) (No. 2) Decree, 1976 (SMC Decree 34); and Investment Policy (Amendment) (No. 3) Decree, 1976 (SMC Decree 37). These amendments did not alter the thrust of the policy as set out in the first Decree.

of bauxite or alumina or both it was at least 30 percent, and at least 20 percent for mineral oil production. For new enterprises engaged in the production of basic necessities, the State participation increased to at least 55 percent, except in the case of enterprises where Ghanaians owned at least 50 percent of capital; in that instance the State need not participate.

What this decree purported to achieve was the compulsory indigenisation of virtually all sectors of the Ghanaian economy by effectively reducing the equity share of foreign investors in nearly all enterprises. This left many pre-existing foreign enterprises with the choice of entering into partnerships with Ghanaians, granted the Ghanaians could raise the necessary capital and thus reduce their share in these enterprises to less than 50 percent or in the worst case sell off all their shares and abandon their operations in Ghana. The decree also strengthened the hand of the Ghanaian government to acquire shares in existing companies thus changing them from wholly-owned foreign subsidiaries to joint ventures. The consequence was a decline in the level of foreign participation and significant flight of foreign capital out of Ghana.

Despite the introduction of policies that increased the involvement of the state in several major economic activities, domestic economic performance did not improve, if anything it got worse. At the end of June 1977, there was a sudden change of policy to move away from a highly controlled economy towards a more liberal regime. In addition, efforts were put in place to reduce the budget deficit, control inflation and achieve a healthy external balance (Hutchful *ibid*; Frimpong-Ansah *ibid*). In June 1978, there was a palace coup within SMC government, culminating in the formation of the SMC II government. This government also continued with the liberal economic agenda by introducing stabilisation measures, which were aimed at establishing fiscal and balance of payments balance. However, by June 1979 the SMC II government was overthrown by the Armed Forces Revolutionary Council (AFRC). The new AFRC government only lasted till September 1979, before handing over power to a civilian administration. No new economic policies were introduced by the AFRC except the vigorous administering of price controls and a brutal campaign against parallel market activities. The new government, formed by the People's National Party (PNP), despite being ideologically aligned to Nkrumah's socialist agenda, appeared to follow the same liberal economic policies started in mid-1977 (Hutchful *ibid*; Huq *ibid*; Petchenkine *ibid*).

3.2.3 The Investment Code, 1981 (Act 437)

In August 1981, the enactment of a new Investment Code, Act 437 reflected the desire to move away from the policy of the previous NRC government to regulate economic activities stringently. The 1981 Investment Code established the Ghana Investments Centre (GIC) to replace the CIB. Although the GIC maintained several of the functions performed by the CIB, a very important new function was included. It was now mandated to "approve and register all technology transfer contracts" and to ensure that investment projects would among other things result in the "importation at reasonable cost, and transfer of technology and technical skills to" Ghanaians. Evidently, the Investment Code had recognised the role FDI plays in the transfer of technology, and by including this requirement as part of the criteria used by the GIC in approving investment projects, at least demonstrated the intent to ensure that investment projects resulted in the transfer of skills and technology.

The main objective of the Investment Code was to consolidate the good parts of the previous two decrees – Capital Investments and Investment Policy Decrees – whilst introducing new amendments to make it more attractive for foreign investors to invest in Ghana. However, as in previous legislation on investments, certain designated areas of the economy were reserved solely for Ghanaians. These areas included retail and wholesale trade not exceeding a certain threshold of capital, estate and travel agency, commercial transportation of passengers by land, manufacture of cement blocks for sale, and the manufacture of foam materials to list a few.

Furthermore, the state was required to participate in areas such as mining activities and the production of oil and gas although the terms of the state's involvement was subject to negotiations between the foreign investor and the GIC. Thus, unlike the Investment Policy Decree, 1975, which required the state to hold a specified minimum share of the equity of enterprises, the Investment Code relaxed the condition and ensured the resulting equity structure was the outcome of negotiation. Moreover, the stringent equity requirements in the Investment Policy Decree, 1975, which ensured that certain economic activities must involve Ghanaian individual investors and/or the state, were relaxed. With the exception of banking and insurance, which required that Ghanaians held a minimum of 40 percent and 60 percent of equity, respectively, all other commercial, manufacturing and service activities could be wholly operated by foreign investors or as joint-ventures with Ghanaians. Evidently,

the changes in the Investment Code represented a departure from the active involvement in commercial, manufacturing and service activities by the state towards a liberal investment environment in which foreign and Ghanaian investors could operate their business without stringent controls by the state.

In spite of the change in policy direction towards a liberal economic framework, the PNP government appeared to lack the commitment to fully implementing policies that would reduce the budget deficit, stem the rise in inflation and boost production. Moreover, the resulting tensions within the PNP government about the direction of economic policy did little to improve domestic economic conditions. By the end of 1981 domestic economic conditions had become dire, providing yet another platform for the overthrow of the PNP government by the Provisional National Defence Council (PNDC). The first 15 months of the PNDC government was characterised by the enforcement of price controls, vigorous actions against parallel market activities and a determination to reduce the budget deficit and curb inflation. Nonetheless, the combination of external and domestic factors culminated in a further plummeting in the fortunes of the economy. Thus by April 1983 the government was left with no option than to turn to the IMF and World Bank for assistance (Killick *ibid*; Hutchful *ibid*; Huq *ibid*; Petchenkine *ibid*).

Thus, from 1983 the broad framework of economic policy in Ghana has been steered gradually away from an economy that had been characterised by varying degrees of government controls towards a more liberal and outward-oriented economy. Consequently, the Investment Code, 1981 was amended in 1985 to reflect the new economic thinking. In the decade that followed a new legislation focusing on promoting Ghana as an attractive investment destination was introduced. In the next sections we briefly summarise the changes in legislation on foreign investment that occurred between 1985 and 1995.

3.2.4 The Investment Code, 1985 (PNDC Law 116)

The 1985 Investment Code (PNDCL 116) represented the first attempt at creating an investment environment that was less restrictive towards the activities of foreign investors in Ghana. Although several aspects of the previous Investment Code were maintained, the Investment Code, 1985 ensured that foreign investors were no longer faced with the restriction of investing in certain sectors of the economy only if there was a minimum equity holding by a Ghanaian investor. Moreover, with the exception of those economic activities that were the sole reserve of Ghanaians, all other economic activities in the commercial, industrial and service sectors were open to foreign investors. Furthermore, foreign investors were not required to be in joint ventures with the state in order to engage in certain economic activities.

The Investment Code, 1985 covered all aspects of investments with the exception of the petroleum and mining sectors, which were covered by separate legislation, that is, the Petroleum (Exploration and Production) Law 1984 (PNDCL 84) and the Minerals and Mining Law 1986 (PNDCL 153). Thus, by the end of 1986 three separate legislations were in force, which were all aimed at encouraging foreign investment in almost all aspects of the Ghanaian economy. As Laryea (1990) notes, by the introduction of these laws, it became evident that for the first time there was an attempt to detail, define and harmonise the legislative and regulatory framework for private investment in Ghana, thus changing the investment orientation to one that is encouraging and accepting of foreign direct investment.

In essence it signalled a new phase in foreign investment legislation in Ghana because, in addition to these laws on investment, exploration and mining, the economic policy framework had moved away from its dirigiste character to a more liberal, market-based type. In such an environment where restrictions on economic agents were few and other spheres of the economy had become open, the incentives and provisions in these laws had more meaning to foreign investors. It thus created a more friendly investment environment than had been the case previously; consequently improving the prospects for higher investment returns, not just for foreign investors but also domestic investors.

3.2.5 The Ghana Investment Promotion Centre Act, 1994 (Act 478)

The enactment of a new legislation, which bears the same title as the name of the investment promotion centre clearly signalled the intention behind this legislation, which was to encourage actively FDI in Ghana. Thus, the Ghana Investment Promotion Centre (GIPC), which replaced the Ghana Investment Centre, had in addition to other tasks the responsibility of aggressively promoting investment opportunities in Ghana to the rest of the world. This new legislation clearly marked the beginning of a new era where the creation of an investment friendly environment through macroeconomic policies was not enough; it was important not just to assure investors of the security of their investments, but efforts were also made to woo them actively. UNCTAD (2003c: 4) notes that at the time of its introduction, the new Investment Code was "praised as the best in Africa" because it had "eliminated the prior project approval and eased company establishment".

The mandate of the GIPC, which were similar to that of the GIC, included additional tasks, such as working towards the creation of an investment climate that was conducive not only for foreign investors but Ghanaian companies too. Furthermore, it was also to undertake research activities concerning investments, keep records of all enterprises as well as technology transfer agreements relating to investments undertaken. Overall, the GIPC Act emphasised the need to promote private sector investment as part of the strategy to accelerate economic growth and development in Ghana.

As stated previously, with the exception of activities reserved solely for Ghanaian businesses, all other activities in the industrial, commercial and service sectors were open to foreign investors. Nonetheless, the provisions of the Act relating to investments set out the minimum capital requirements of $10,000 or its equivalent worth of capital goods in the case of joint ventures with Ghanaians and $50,000 or its equivalent worth in capital goods by way of equity capital in the case of a wholly owned foreign establishment. These sums are very little in comparison to the huge investments undertaken in many developed and newly industrialising countries. These minimum capital requirements do not however apply to portfolio investments and enterprises set up solely for export trading.

Tsikata et al. (2000) note that the significant difference between the Investment Act 1994 and the 1985 Investment Code is that the former aimed at revising the latter by emphasising the role of private sector investments in ensuring accelerated economic growth in Ghana. The Act is also different because it recognised the 1985 Investment Code as more regulatory in focus and thus limiting the ability of the Investment Centre to engage in investment promotion activities.

3.2.6 The Ghana Free Zones Act, 1995 (Act 504)

The passing into law of the Ghana Free Zones Act represented a further commitment to the goal of encouraging businesses to set up operations in Ghana. It was also an indication to the business community that Ghana was open for business, after several decades when business people were viewed with suspicion by governments. The law also established the Ghana Free Zones Board (GFZB) as the agency in charge of registering, supervising and monitoring of activities of firms registered by the Board.

The idea behind the free zones was to create a set of attractive incentives and the provision of efficient services, which resulted in a relatively smooth business environment for firms to operate. These incentives include a 100 percent exemption from payment of direct and indirect duties and levies on all imports for production and exports from free zones, 100 percent exemption from the payment of taxes on all profits for ten years, an income tax rate capped at 8 percent after the ten-year period, and a total exemption from the payment of withholding taxes from dividends arising out of free zone investments (Ghana Free Zones Board 2009).

The expectation was that firms would achieve higher returns on their investment whilst exporting a significant proportion of their output. The free zones concept was not restricted to foreign firms; it also encouraged domestic firms to set up in the free zones area. It permitted free zones enterprises to undertake production, manufacturing and service activities, including financial services. It also allowed the development of commercial and service activities at seaport and airport areas, and also served as the focal point for goods production and access to foreign markets.

The free zones programme is thus designed to promote processing and manufacturing of goods through the establishment of Export Processing Zones (EPZs). Currently, there are four export processing zones in Ghana with a wide range of firms

engaged in light and heavy manufacturing activity, information technology, telecommunications services, and upstream and support services to other sectors of the economy.

3.3 Summary of Trends in Policy on FDI

The previous paragraphs have attempted to summarise the various attempts (primarily legislative) by previous governments to attract FDI or as the case was in 1975, for the State to capture "the commanding heights" of the Ghanaian economy. What clearly emerges from these laws are a range of incentives and directives, which are intended, not only to stimulate industrial and economic activity and growth, but also to promote foreign and Ghanaian entrepreneurial partnerships. The response of foreign investors has on the whole been positive, though the scale and amount of foreign investments had been relatively small. But this has to be set against a backdrop of an era when the attitude of government towards foreign capital could at best be described as uncertain and at worst outright hostility. This was however not an uncommon situation in many developing countries for much of the period before the early 1990s.

We also observe that it was not until the relaxing of the requirement in 1994, which had been present in the previous laws, for foreign investors to enter into joint venture agreements with Ghanaians that the inflow FDI began to increase. But it is worth stressing that this period also coincided with a period of economic and political reforms, which were effectively part of the Washington and Post-Washington Consensuses that had become dominant policy paradigms at the beginning of the 1990s. Another observation worth making is that the raft of incentives that were introduced presupposes that, whilst the general hostility towards foreign investors existed for the period before 1986, the importance of foreign capital in economic development was not lost on policy makers.

What is also interesting are the efforts in recent years made by several developing and transition economies to attract FDI, which has been termed the *race to the bottom*, referring to the situation in which countries out-compete each other by offering mouth-watering incentives to attract foreign investors. But this practice appears to have begun long ago in Ghana. The Capital Investments Act of 1963 had in place tax and other non-financial incentives intended to lure foreign investors to Ghana.

The incentives offered under these laws are not very dissimilar to what exists in the current legislation. Indeed, the 1963 Capital Investments Act had importantly recognised what has now become a catchphrase among policy makers and academics in Ghana; *creating an enabling environment*, in this instance, for private foreign direct investment to flourish. But what is amply demonstrated in respect of the development of a legal framework towards achieving an environment conducive for FDI is that ambivalence and incoherence in attitudes by the political and social actors has proved unhelpful.

What emerges is that legislation and policy discussion-cum-interventions on foreign direct investment have a long history but changed over time in accordance with the needs of the country, the character of government, and as we will see later, the changing global economic paradigm away from dirigiste policies towards more liberal economic policies.

3.4 Foreign Direct Investment in the Mining Sector

Ghana's mining sector has traditionally been the primary recipient of foreign direct investment before independence in 1957. The main attraction for foreign investors into the mining sector has been the gold reserves, which gave that country its former name, the Gold Coast. Diamond, bauxite and manganese are the other major minerals mined in Ghana. Although the four minerals have been important to the country in terms of foreign exchange earning capacity, gold mining remains the dominant industry. In terms of significance to the Ghanaian economy, the contribution of gold is only paralleled by the cocoa sector. Currently, the volume of Ghana's gold production is only second to that of South Africa. Growth in the diamond, bauxite and manganese industries, on the other hand have remained sluggish in the last decade.

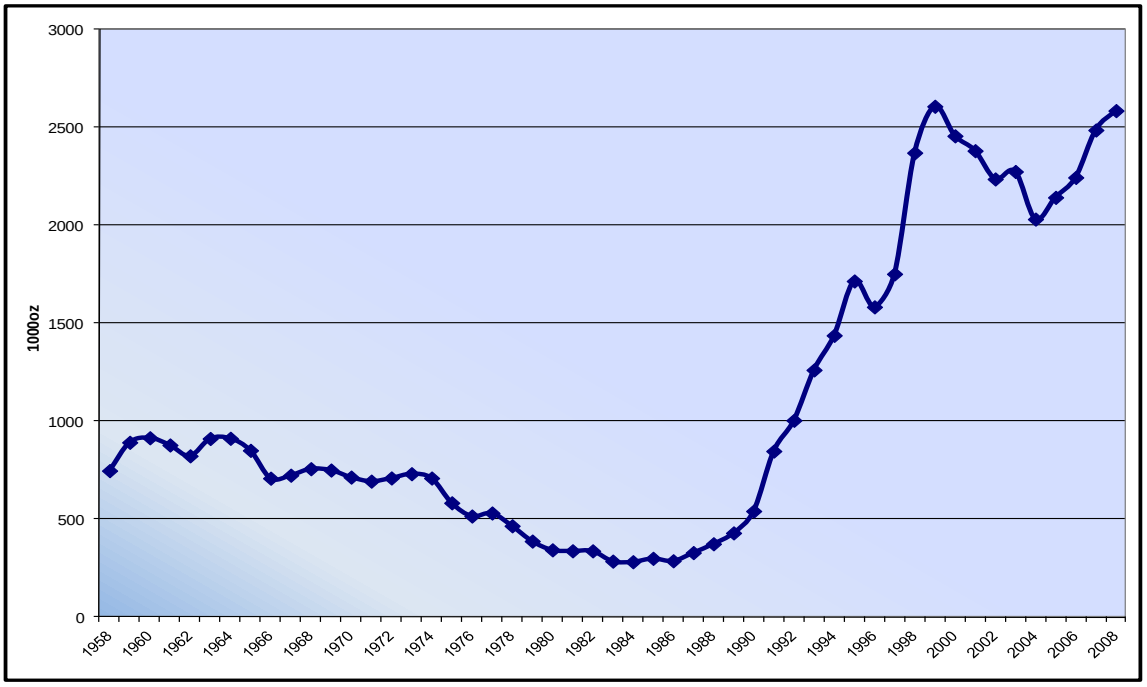
Investments in the mining sector began to decline from the mid-1960s, partly as a result of nationalisation of almost all the mines after independence in 1957. A couple of years after independence Tsikata (1997) reports that the mining industry was characterised by state control, with the main purpose to protect employment and have access to foreign exchange, which might otherwise be controlled by foreign owners. But there were other reasons too. For example, Huq (1989) reports that in 1960, the government took control of several gold mines, after the private companies threatened

to close them down, and formed the State Gold Mining Corporation in 1961. But in the context of an era (from the mid-1950s to early 1980s) when foreign direct investment was viewed with suspicion, it is unsurprising that many mines were eventually nationalised by the mid-1970s, effectively placing control in the hands of the state as opposed to foreigners.

Hence the political atmosphere at the time might have created an impression of an *anti-foreigners* stance by the government. But this apparent anti-foreign investor stance was partly a reflection of the ongoing debates among academics on the relations between multinational firms and developing countries in those years. Foreign investors were not perceived as having a benign influence on developing countries; their presence therefore served as potential threat to the national development effort. However, it is worth noting that between the mid-1950s till the late 1980s, the policy and academic views on FDI were not settled. The debates surrounding the impact of multinational corporations in poor, newly independent developing countries ranged from its being positive or benign to its being malevolent. For a flavour of the contrasting views on the impact of multinational corporations on developing countries, see (Rothgeb Jr. 1989; Alschuler 1988; Hymer 1975) to list a few.

Undoubtedly, the policy of nationalising mines and the consequent flight in capital resulted in underinvestment, increased inefficiency and loss of global competitiveness of the mining sector. Consequently, gold production as well as that for other minerals began to decline. This also mirrored the general downturn in economic performance of the country that began from the latter parts of the 1960s, was accentuated by the mid-1970s and lasted till the mid-1980s. The declining trend in gold production only began to reverse in the early 1990s only after the large investments and changes to the legislations governing the minerals sector. Figure 3.1 illustrates the trend in gold production in 1000 ounces from 1958 to 2005. The steady decline in gold production began from about the mid-1960s, worsened by the mid-1970s and began to halt towards the end of 1980s. By the beginning of the 1990s, output had begun to rise and increases in output since then has been dramatic. By 2000 gold production had risen to nearly 2.6 million ounces (Ghana Chamber of Mines 2008a & b).

Figure 3.1: Annual Gold Production in 1000oz from 1958 - 2008



Source: Ghana Minerals Commission and Ghana Chamber of Mines

In the face of declining investment and output, there were several attempts by governments, starting from 1981, to address this problem. Subsequently, in 1985 and 1986, the legislation and investment codes governing mining sector activities were modified in an attempt to attractive more investment, especially private investment. It was also an attempt to alter the perception that state policy was 'anti-foreigners.' For instance, in 1975 changes were made to the fiscal regime governing the mining sector to attract more investment from the private sector. The corporate tax rate was reduced from 55 percent to 45 percent. Similarly, royalties and foreign exchange tax were reduced. However, as we have seen earlier, the Investment Policy Decree in 1975 also required the State to have a large stake in the mining sector. The inconsistencies in policies and the general political environment meant these changes to policy could not reverse the declining trend in output and low investments in the sector. The investment laws governing mining operations appeared to lack credibility and the procedures firms had to observe regarding their operations were rather unwieldy.

The economic reforms that commenced in 1983 proved to be the platform from which further reforms in the mining sector were undertaken. The World Bank (1984) had attributed the decline in output in the mining sector to the lack of investment in the mines and infrastructure, such as rail transport and the harbours, lack of expertise, an overvalued exchange rate, high absenteeism and low worker discipline, illegal mining

and gold smuggling, and a decline in the grade of ore. Consequently, the World Bank and IMF supported a set of policy and legal reforms for the mineral sector, which commenced in 1986 – the mining sector reform programme. Box 3.0 provides a list of principal legislation and laws affecting the minerals sector.

The sector-specific programme included the provision of infrastructure improvement loans from the World Bank, the commitment by the government to change the regulatory framework governing mining operations in Ghana, strengthening institutions that support mining activities, minimising the extent of state involvement in mining operations through divestiture and privatisation, enhancing the fiscal regime governing mining companies and formulating environmental guidelines on mining activities. These were aimed at making investments in the mining sector attractive to foreign investors and very lucrative. In effect parts of the economic reform policies could directly be attributed to attempts to boost the level of foreign direct investment in the mining sector.

Box 3.0: List of Principal Legislation and Laws affecting the Mining Industry in Ghana

- Mining Rights, Licences and Certificates Law 1983, P.N.D.C. Law 67
- Additional Profits Tax Law 1985, P.N.D.C. Law 122
- Minerals and Mining Law 1986, P.N.D.C. Law 153
- Minerals Commission Law 1986, P.N.D.C. Law 154
- Minerals Export Duty (Abolition) Law, P.N.D.C. Law 182
- Diamonds (Amendment) Law 1989, P.N.D.C. Law 159
- Mercury Law 1989, P.N.D.C. Law 217
- Small-Scale Gold Mining Law 1989, P.N.D.C. Law 218
- The Precious Marketing Corporation Law 1989, P.N.D.C. Law 219
- Establishment of the Precious Marketing Corporation 1989
- Minerals Commission Act, 1993
- The Mining Operations (Government Participation) (Repeal) Act, 1993
- Minerals and Mining (Amendment) Act, 1994
- The Gold Mining Products Protection Ordinance (Amendment) Act, 2001
- Minerals and Mining Act, 2006

Source: Minerals Commission of Ghana and Ghana Publishing House

The initial inflows of foreign direct investment came in via the divestiture of state assets and the privatisation programme. The initial role of foreign investors was restricted to management contracts because all the major large mines were being rehabilitated with loans and support from the World Bank. Not until the beginning of the 1990s did significant foreign investments begin to flow into the mining sector. The bulk of the foreign direct investment to the sector was to the gold mining industry. The result since 1997 has been a boom in gold mining, with Agbesinyale (2003) describing it as an unprecedented multinational corporate-driven gold rush in the history of Ghanaian mining.

The most prominent gold mining enterprise in Ghana is Ashanti Goldfields Corporation, which was established 1897. It is also one of the well-known success stories of the transformation of the gold industry in Ghana. The company, which originally started operations as a private mine, had by 1975 a 55 percent stake in its operations by the government. After the inception of economic reforms and privatisation, the company eventually metamorphosed into a multinational mining company and merged with the South African mining company AngloGold, and currently operates under the name, Anglo-Gold Ashanti, which is headquartered in Johannesburg, South Africa. Ashanti Goldfields Company before merging with Anglo-Gold South Africa had itself gone multinational acquiring mines in Guinea, Mali, Zimbabwe and Tanzania. It has also been prospecting in over ten other African countries. This transformation came after a successful listing on the New York Stock Exchange in 1996, the first African company to appear on Wall Street.[16]

In terms of FDI inflows, between 1986 and 2009 it is estimated that aggregate inflows to the mining sector has exceeded $5billion with the bulk of investments originating from the United Kingdom, South Africa, Canada, the United States of America, Australia as well as other major European countries (Ghana Chamber of Mines 2010). It is worth mentioning that the mining sector generally accounts for over 50 percent of all FDI inflows to Ghana. The trend in mining investment in Ghana is part of a general surge in interest in the mining sector in Africa (UNCTAD 2005: 39) in that there have been "major changes to the mining codes, which have resulted in the

[16] This brief history of Ashanti Goldfields Corporation and its merger with AngloGold South Africa was based on *A History of Ashanti Goldfields Company* on the AngloGold Ashanti website (www.anglogold.co.za) and from http://ashanti-goldfields-corporation.co.tv/ accessed on May 10, 2011.

withdrawal of the state, expanded opportunities for the private sector and increased incentives to attract FDI".

We do not have any figures on an annual basis of the amount of foreign direct investment to the mining sector. Data on FDI inflows to the sector is difficult to obtain because several agencies are in charge of record keeping. Nonetheless, UNCTAD (2008) estimates for Ghana show that approximately 70 percent of FDI inflows since 1993 were to the mining sector. In spite of the lack of consistent data on FDI inflows to the mining sector, an indication of the magnitude of private investment (foreign and Ghanaian) which the mining sector has attracted can be gauged by the number of new firms in the sector.

Prior to 1983 there were fewer than seven companies in the mining sector. These were the State Gold Mining Corporation, Ashanti Goldfields Corporation, Ghana Consolidated Diamond Company, Ghana Bauxite Company and Ghana National Manganese Corporation. But through privatisation and divestiture and the reform of the legislation governing private investment, the number of mining companies has more than doubled. Almost all of these companies are gold mining. Table 3.1 lists some of the major gold mining companies in Ghana. The main sources of foreign investment are Australia, South Africa, Canada, China, United States, United Kingdom and Norway. Agbesinyale (2003) for example reports that by 1985 there were only five large gold mining companies operating, but this had risen to more than 230 mining companies of various sizes registered with the Ghana Minerals Commission in 2000.

Table 3.1: Major Gold Mining Companies Operating in Ghana, 2009

Ashanti Goldfield Company (Obuasi Mine)	Dunkwa Continental Goldfields Limited
Goldfields Ghana Limited	Obenemase Gold Resources Limited
Teberebie Goldfields Limited	Amansie Resources Limited
Ghana Australian Goldfields Limited	Southern Cross Mining Limited
Aboso Goldfields Limited	Cluff Resources Ghana Limited
Satellite Goldfields Limited	Goldenrae Mining Company Limited
Prestea Sankofa Gold Limited	AGC (Bibiani) Limited
Billiton Bogoso Gold Limited	AGC (Iduapriem) Limited

Source: Ghana Chamber of Mines and Ghana Minerals Commission

3.5 The Ghana Divestiture Programme, Privatisation and Foreign Direct Investment

One of the major changes to have taken place in the political and economic history of Ghana was the divestiture of state-owned enterprises under the Ghana Divestiture Implementation programme, which was launched in 1988. The programme followed on the heels of the Economic Recovery Programme, which began in 1983 and thus constituted a part of the economic reform package. Prior to the commencement of the divestiture programme, the State-owned Enterprises Reform Programme was started in 1987. This programme's aim was to improve the performance of enterprises where they remain state-owned and the rationalisation of the state sector by means of the divestiture programme (Divestiture Implementation Committee 2008). As part of the Divestiture Implementation Programme, which commenced in 1988, the government set out details for private sector participation in the operations of erstwhile state enterprises. This formally began a process of privatisation, which eventually resulted in the significant role played by foreign investors in the Ghanaian economy today.

From 1958 the role played by the state in economic activities progressively increased. This was reflected in an expansion in the scope and number of enterprises set up in almost every sector of the economy. There was virtually no aspect of the Ghanaian economy that was not affected by the state. Consequently, many Ghanaians became emotionally attached to these enterprises and were therefore less than enthused about any change of ownership from the state to a private operator. Indeed, these nationalistic sentiments are still present in Ghana, with significant opposition to recent privatisations in the telecommunications, airline and oil sectors. It is therefore against this background that the implementation of the programme is seen as significant.

At the start of the privatisation process in 1988 there were 350 state-owned enterprises; many of them were loss-makers. By 1995 the Divestiture Implementation Committee had approved 195 divestures (Katsouris 1998). Under the privatisation programme, the majority of sales (in terms of number of enterprises sold) have been to Ghanaian investors with about two-thirds of sales completed locally. But in terms of value, sales to international investors are much higher with the average value of sale to a Ghanaian investor being about 23% of the average value of a sale to an international investor (Bayliss 2004). The divestiture-cum-privatisation programme also served as a

platform to attract private sector capital and expertise from within and outside Ghana. Private capital, especially from outside Ghana, was to be achieved in terms of FDI inflows, as foreign investors took over the divested state-owned enterprises.

By December 1998 the Divestiture Implementation Committee reports that a total of 212 state-owned enterprises had been divested, either fully or partially, which represented approximately 60 percent of state-owned enterprises at the start of the process in 1988. The sale of these state-owned enterprises attracted substantial inflows of FDI, although precise estimates of FDI inflows associated with the privatisation process is unclear. However, various estimates of FDI inflows have been provided. Katsouris (1998) reports that by 1997 the World Bank noted that FDI from divestiture increased from US$25 million in 1993 to US$35 million in 1995, although this fell to US$20 million in 1996. The Divestiture Implementation Committee also reported that by December 2003 the total payments received from the sale of state enterprises approximated US$158 million. Despite the various estimates of FDI inflows, what is not in doubt is that the divestiture and privatisation programme proved to be the impetus for the subsequent surge in FDI inflows to Ghana at the beginning the new millennium.

At about the same period that the divestiture programme commenced, there were important developments in the financial sector. In 1988 the Financial Sector Adjustment Programme (FINSAP) was launched to restructure the entire financial sector, in particular the banking sector.[17] As part of this programme, financially distressed banks were restructured, the regulatory and supervisory framework of the banking system was improved, and there was an increased effort to improve the mobilisation and allocation of financial resources. The effort to improve resource mobilisation involved the development of the money and capital markets. Consequently, by July 1989 the Ghana Stock Exchange was set up, although the idea to set up a stock exchange had been hatched nearly two decades prior. Thus by the end of 1990 trading on the stock exchange began with a formal launch in January 1991.[18]

[17] The FINSAP was part of the Structural Adjustment Programme and was carried out with support from the World Bank.
[18] Accessed from the Ghana Stock Exchange website (http://www.gse.com.gh/index1.php?linkid=1)

These two events permitted the further divestiture of state-owned enterprises through the stock markets, allowed the public flotation of shares by the government of state-owned enterprises and banks, and provided a means by which foreign investors could acquire interests in these divested enterprises. For example, in 1995 the Social Security Bank was listed on the stock exchange with the Ghana Commercial Bank (the largest of the state-owned bank) listed in 1996. The Social Security Bank is now controlled by the Société Générale Group of France. In the two decades since its inception, the stock exchange has attracted several institutional and small private investors, both foreign and local, and was voted as the best performing stock exchange in all emerging markets in 1994 having been ranked as the sixth best index performing emerging stock market in the previous year. In 2010 it was adjudged the most innovative stock exchange in Africa.

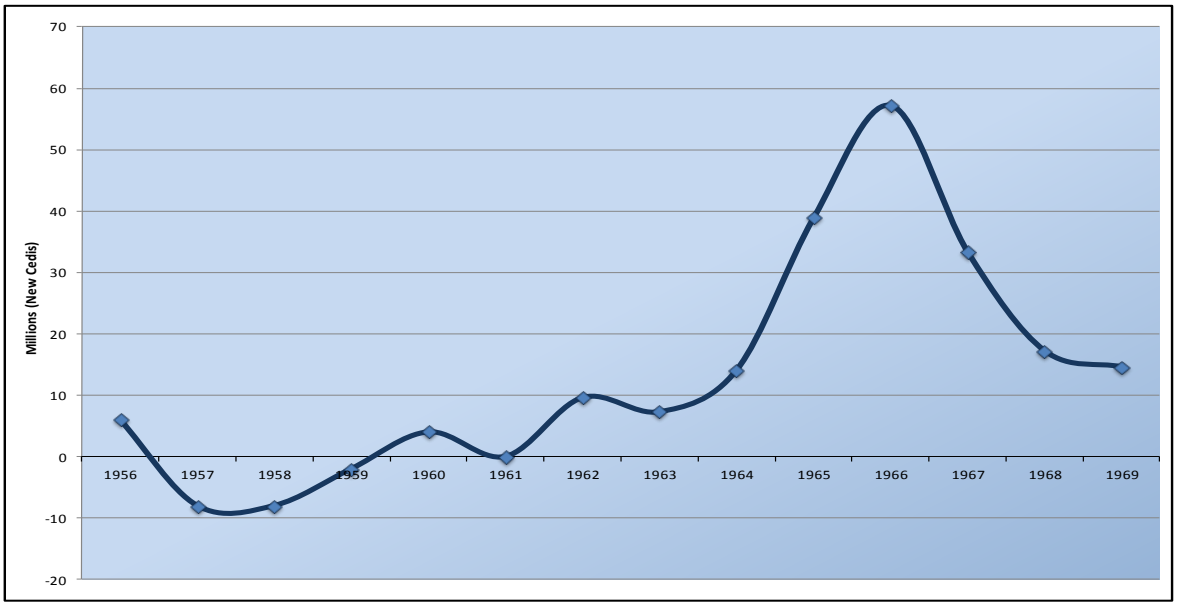
The rapid growth of the Ghana Stock Exchange has also facilitated a greater integration of the economy with that of the world. Consequently, international investors who seek a higher return on their investments have found the Ghana stock exchange an attractive place to invest. But increased integration with international financial markets brings with it the threat of greater exposure to the high volatility associated with international financial markets and the possibility of adverse effects on investment inflows in the long-run. The downside therefore is the possible destructive consequences arising from the herding behaviour of institutional investors and large reversals of portfolio investments in particular. Given that several domestic and foreign firms seek to raise additional capital through the stock exchange, such behaviour can be detrimental to their long-term planning and growth.

Despite these potential threats to firms and the economy at large, it is undoubted that these developments that have taken place in the financial sector since the late 1980s have provided the stimulus to significant FDI activity in the country and especially in the services sector. And as Bayliss (2004) has argued the economic recovery programme and structural adjustment programme have created an economy that has become increasingly dependent on the service sector, including the informal sector. Thus in recent years, in addition to the banking sector, there have been significant inflows of FDI to the tourism, real estate, telecommunications, and general trade. But the amount of FDI into the manufacturing the sector has been relatively small. In the next section we discuss the patterns of FDI inflow to the non-mining sector.

3.6 General Patterns of Foreign Direct Investment, 1956 - 1969

In this section we examine trends in aggregate private foreign direct investment flows to Ghana.[19] An important caveat is necessary at this juncture. Early data on private direct investment are rather sketchy and therefore hinders any effort at presenting a very complete picture of the pattern of FDI inflows for the period up to 1969. Data for the period 1956 to 1969 is extracted from the work of Brown (1972). Using balance of payments information, Brown estimates data on Net Private Long-Term Direct Investment from 1956 to 1969, which we use as a proxy for FDI. Figure 3.2 depicts the trend in FDI inflows for the period 1956-1969.

Figure 3.2: Net Private Long-Term Direct Investment (Millions New Cedis), 1956-1969



Source: Data from Brown, T. M. (1972)

Evidently, Figure 3.2 shows that FDI inflows for the period before 1965 were very little. In the immediate years after independence the net flows were negative. This may be attributed to the uncertainty brought on by the emergence of a newly independent country, and the fear that foreign enterprises would be nationalised by a government that was championing the course of African nationalism. It is thus evident that the enactment of the Pioneer Industries Act in 1959 did not have any significant impact in terms of FDI inflows. As we noted in our discussion on the Act, it made no specific mention of foreign investors and appeared too restrictive in terms of encouraging FDI.

[19] The measure of FDI used is based on the aggregate flows recorded in the balance of payments.

The introduction of the Capital Investments Act of 1963, which was aimed at encouraging inward FDI to Ghana, appeared to have reversed the trend. Thus, we observe that after 1963, inflows of FDI increased significantly, relative to the trend in the previous 5 years. This significant increase can also be attributed to the construction of the Akosombo Hydro-electric dam, which commenced in 1963. Nearly half the funding cost came from overseas, mainly the United States and the World Bank.

Table 3.2 presents data on the allocation of FDI by sectors for the year 1963. We find that most of the FDI were into the mining and quarrying, trading, petroleum and refining and manufacturing sectors; very little FDI went other sectors, such as agricultural and fishing. The predominance of FDI in the mining and quarrying sector is unsurprising; Ghana is rich in mineral deposits, such as gold and diamonds. The large FDI presence in the trading sector also reflects the long historical trading relation between Ghana and many European countries and the presence of many traders from India and the Middle East, especially Lebanon.

Table 3.2: Sectoral Distribution of Foreign Direct Investment in Ghana, 1963

SECTORS	NUMBER OF ESTABLISHMENTS	AMOUNT (¢MILLION)	% SHARE IN INVESTMENT
Manufacturing	36	15.06	11.7
Trading (Commerce)	82	44.07	34.2
Other Services including Electricity	42	2.61	2.0
Construction	7	0.29	0.2
Transport, Storage and Communications	10	1.09	0.8
Petroleum and Refining	8	20.55	16.0
Mining & Quarrying	6	44.55	34.6
Agriculture & Fishing	3	0.56	0.4
Total	194	128.78	100.0

Source: Table 4.10 in Baah-Nuakoh (1997: 81), sourced from Bos et al. (1974)

In February 1966, a coup d'état by military officers removed the Nkrumah government, which led to the introduction of a series of actions and policies that were contrary to what was previously pursued. The ideology of the new military regime, the National Liberation Council (NLC), represented an entirely different one to that of the Nkrumah administration. The NLC was opposed to the socialist agenda of Nkrumah and were more inclined towards a liberalised free-market economy (Frimpong-Ansah 1991; Killick 2010). It is however ironic that in the year that the Nkrumah administration was overthrown inflows of FDI peaked. But what emerges afterwards is a collapse in FDI inflows. This collapse can be attributed to the promotion of a policy of industrial indigenisation, whereby Ghanaian entrepreneurs and industrialist were supported by the NLC and later the Busia administration, which took over in an election conducted in 1969.

Overall, however, during the entire period under consideration (1956–1969) annual FDI inflows were generally low. This can be ascribed to an initially non-existent legal framework to encourage FDI and an uncertainty created by the emergence of a newly independent African country led by a champion of African economic and political independence. Baah-Nuakoh (1997: 78), for example observes, that the "investment climate was not as encouraging as stated in the law", whilst (Tsikata et al. 2000: 29) describes "Nkurmah's attitude towards foreign direct investment to be ambivalent at best".

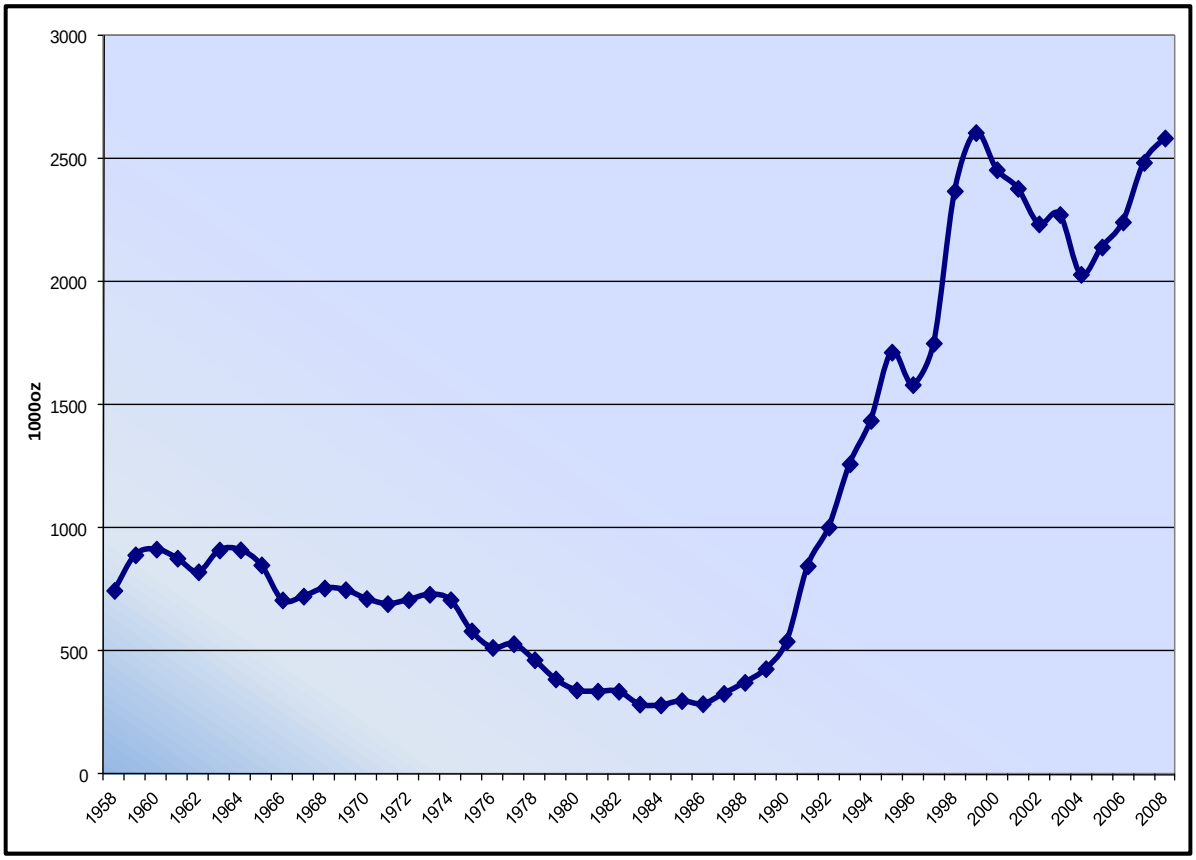
3.7 Trends in Foreign Direct Investment, 1970 – 2009

In this section we examine trends in foreign direct investment inflows from 1970 to 2009. Data on foreign direct investment inflows to Ghana from 1970 are available on a more consistent basis from the UNCTAD World Investment Reports and their accompanying databases. This therefore permits a more meaningful assessment of inward FDI trends in Ghana compared to our earlier attempts in the previous sections.

Figure 3.3 depicts the trends in annual inflows of FDI to Ghana from 1970 to 2009. A similar pattern is repeated in Figure 3.4 where the trend in the ratio of FDI in GDP between 1979 and 2009 is depicted. It is apparent that from 1970 to 1992 there was very little by way of foreign direct investment coming to Ghana. The average annual inflow for this period was just over US$ 15 million. Since the early 1990s the

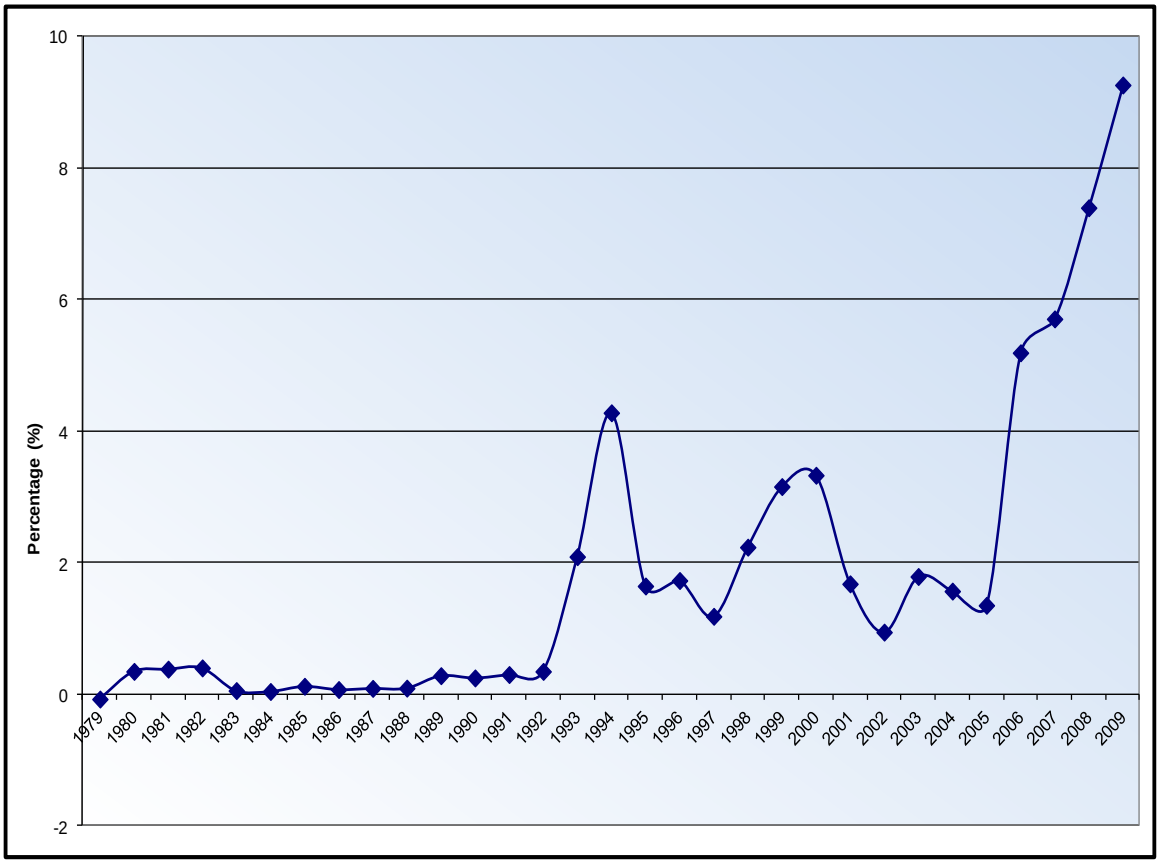
importance of FDI in the economy has become apparent as inflows have increased and the proportion of FDI inflows to GDP has consequently risen. Both Figures 3.3 and 3.4 also show the degree of volatility of inflows for most of the 1990s. Much of this volatility was due to the difficulty and uncertainty associated with the privatisation of state enterprises, especially the most politically sensitive ones, such as the Ghana Commercial Bank, Social Security Bank and the Ghana Telecommunications Company. But it is also a reflection of the unease in the 1990s when several SSA countries were undergoing social and political changes as a result of the winds of democracy that was blowing across the continent.

Figure 3.3: Annual Inflows of FDI to Ghana in Nominal Terms (Millions US$,), 1970 - 2009



Source: UNCTAD Database 2011

Figure 3.4: Ratio of Inflows of FDI to GDP, 1979 - 2009



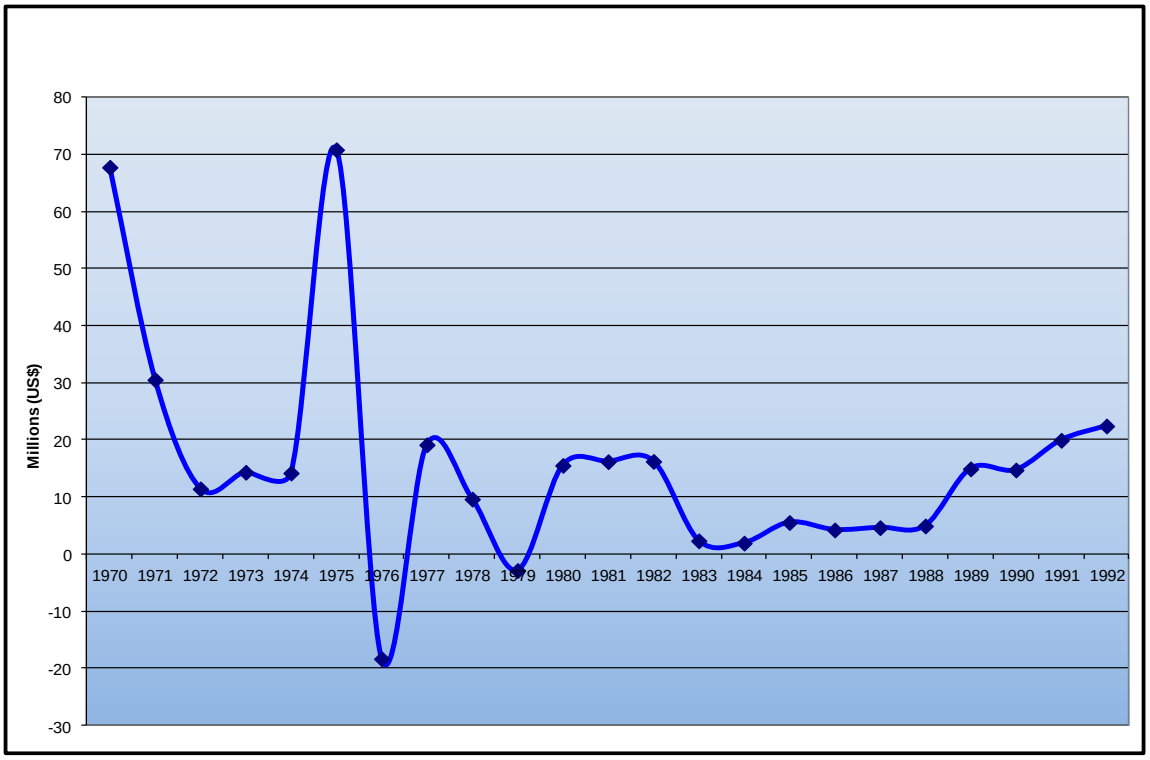
Source: Author's calculations using data obtained from the Ghana Statistical Service, Bank of Ghana and UNCTAD Database

The volatility of inflows is not restricted to the 1990s. The pattern of FDI inflows depicted in Figure 3.3 masks the volatility inflows associated with the period 1970 – 1992. The relatively large inflows of FDI in from the latter half of the 1990s distorts the trends in the preceding years. Consequently, we split the trend into two – the first, from 1970 to 1992 and the second, from 1993 to 2009.[20] Figure 3.5 depicts annual inflows of FDI from 1970 to 1992, which reveals the extent of volatility of FDI inflows that characterised the period between 1970 and 1986. In 1976 and 1979 there were negative inflows of FDI, which suggests a significant flight of capital. While the explanation for this flight of capital is not apparent, it is possibly the result of a combination of political turmoil, economic instability and investment uncertainty. For example between 1972 and 1979, there were three military coup d'états, resulting in dramatic changes to government policies, greater involvement of the state in economic activities, a decline in economic performance and the repression of the political and

[20] The choice of 1992 as the cut-off year is informed by the transition in 1993 to a new democratic era that saw the commencement of the Fourth Republic in Ghana.

business elite. In the face of such political and economic instability, it is unsurprising the degree of volatility experienced between 1970 and 1986.

Figure 3.5: Annual Inflows of FDI to Ghana in Nominal Terms (Millions US$), 1970 to 1992



Source: UNCTAD Statistical Database 2011

As Tsikata et al. (2000) argue after the coup d'etat of 1972 there emerged a three-way nexus of poor economic growth, low investment and political instability. In that year, a growth rate of 2.3 percent that was recorded was accompanied by a more than 60 percent drop in FDI. Similarly, in 1979 the Armed Forces Revolutionary Council (AFRC) seized power and adopted an anti-business stance. GDP growth fell to as low as –3.2 percent, though there was only an outflow of US$ 3 million. The state of the economy worsened thereafter, that is, an economic growth rate on average was –2.17 percent per annum from 1979 to 1983. The inflow of FDI averaged only US$10 million per annum during this period.

In 1983 the country began to implement economic reforms under the World Bank and IMF. Thus by 1986 we begin to see a gradual and steady increase in FDI inflows. The initial inflows were rather small by world standards, although it is important to stress that this trend mirrors the generally low proportion of FDI inflows to sub-Saharan Africa. Nonetheless, it appears that by 1986 the country had turned the

corner and was beginning to attract private investment again. The initial inflows were largely directed to the mining sector, which received a lot of support from the World Bank in terms of restructuring and reinvestment. However, by the beginning of the 1990s there began a gradual rise in the flow of FDI to Ghana, which was largely the result of the privatisation of state-owned enterprises. Although the inflows were increasing, these were relatively small in global terms.

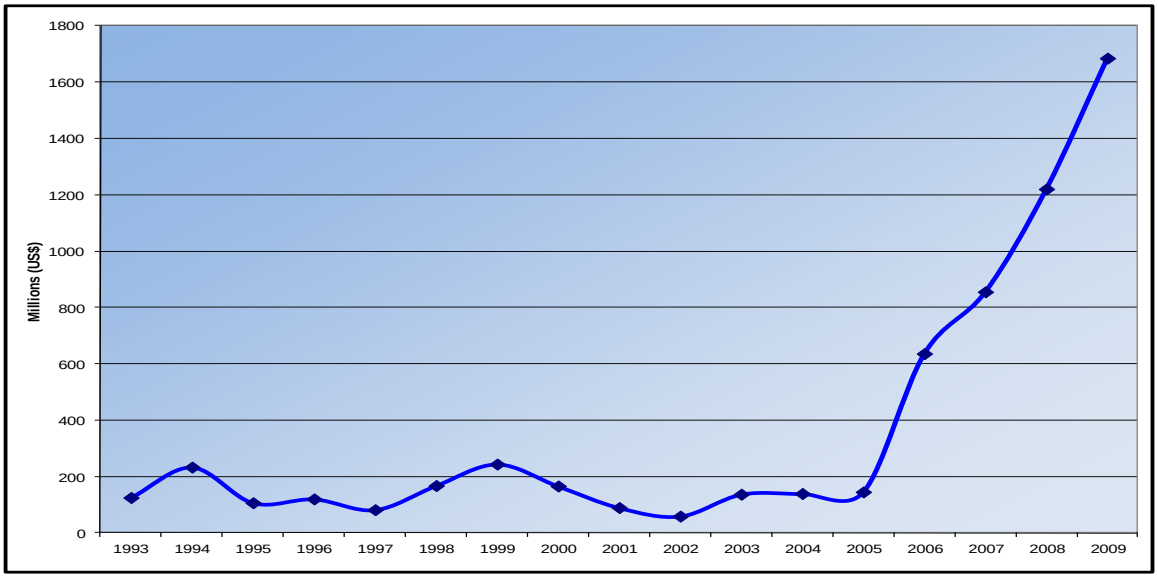
The paucity of foreign investments inflows which were recorded between 1960 and 1992, compared to that recorded afterwards is very dramatic. What factors might have accounted for these relatively low levels of FDI flows to Ghana during that period? This we argue must be attributable to the following factors. First, the frequent changes in government laws pertaining to investment in general and foreign investment in particular and a lack of coherence in these laws due to the high level of political instability. Second, the reasons in the first, created high degrees of uncertainty not just about the future direction of policy but about the profitability of investments made, especially where governments are military in nature and/or where civilian governments make pronouncements which generate such fear and uncertainty. Thirdly, there also appears to have been more talk and refinement of legislation but less convincing action to encourage foreign investment, especially when Ghana did not represent a particularly unique investment destination. And finally, despite the incentives available in these investment laws, it was also the case that other macroeconomic policies, such as an overvalued exchange rate, controlled prices of goods and services, and a generally interventionist posture of government, resulted in significant inconsistencies regarding the overall economic policy mix.

Remarkably, from 1993, a year which marked the return to constitutional rule and the re-launch of a democratic form of governance, after several decades of military rule, FDI inflows began to rise significantly compared to the previous decades. Figure 3.6 presents the annual inflow of FDI from 1993 to 2009. The average inflow of FDI from 1993 to 2000 was US$155.4 million, which was nearly 14 times the average inflow between 1980 and 1992. It is therefore apparent that inflows of FDI had significantly picked up from the very low levels previously. It appears that several events must have conspired to be bringing this about.

In essence towards the end of the last millennium Ghana had become a favoured destination for foreign investors, hence the continual and steady increase in FDI inflows. This change was the culmination of legislative reform, economic reform, financial reform and political reform. As we had seen earlier, during the 1990s, the privatisation programme had gained momentum with government selling off its shares in state-owned banks, mining companies, the state telecommunication company to list a few. Further, the stock exchange had become very attractive for foreign and domestic investors, the economy had experience consistently positive GDP growth rates since the mid-1980s and the political atmosphere had significantly improved.

Nonetheless, the pattern of inflow of FDI since 1993 has not been generally upward rising. Although average annual inflows from 1993 to 2002 had been slightly below US$140 million, the inflow of FDI has demonstrated an undulating pattern. There have been significant falls registered between 1995 and 1997, and very dramatically after 2000. This declining trend only began to pick up after 2003. Average annual inflows between 2000 and 2005 were US$122.5 million, lower than the US$153.9 million for the period between 1993 and 1999. In 1995 it is unclear why inflows declined. But we postulate that the run-up to elections in the following year might have created some levels of anxiety in the international investment community. In 1997 however, the decline can plausibly be attributed to the negative impact of the energy crisis on industrial productivity and the economy as a whole. This probably accounts for why foreign investors avoided Ghana in those years.

Figure 3.6: Annual Inflows of FDI to Ghana in Nominal Terms (Millions US$), 1993 to 2009



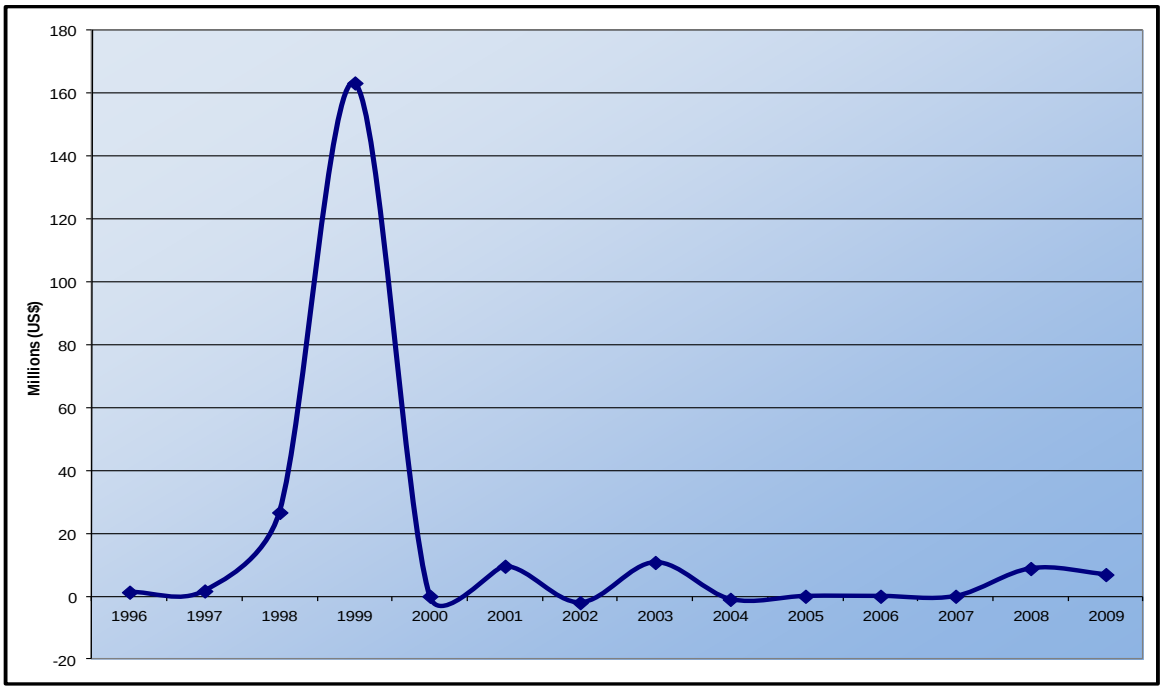
Source: UNCTAD Statistical Database 2011

In 2000, there was a general sense of unease in the period leading to the elections later that year. There was uncertainty regarding whether the incumbent administration would hand over power if it lost the election. All of this created fear and anxiety, which was heightened by a report that even some Ghanaians were locating their wealth and families overseas to avoid the consequences of any strife that might occur. In the end, all went well and there was a smooth transition to another party. Nevertheless, after 2000 the trend continued to show a decline. Whilst it is not clear why this should be so, we postulate that this might be related to the decision of the new administration to opt for the Highly Indebted Poor Countries (HIPC) Initiative of the IMF and World Bank. These concerns stemmed from uncertainty regarding what financial and other economic policies were to be pursued under the HIPC Initiative.

There has been a sharp increase in annual inflows from 2005. What accounts for this drastic rise in FDI? The Ghana Investment Promotion Centre (GIPC) reports that in 2006 238 projects were recorded, the highest number of projects recorded since 1994. But it also reports that the exceptional rise in the inflow of FDI recorded in 2006 was due to the huge investment by ALCOA Inc. in the bauxite and aluminium smelter industry. But there other reasons that will explain the surge in FDI inflows. These include the entry into the Ghanaian banking industry of foreign banks and insurance companies, as well as investments in real estate, tourism, telecommunications and general trading. Further increases in FDI have come about as a result of the discovery of oil and gas in commercial quantities in 2007. This has therefore created a sudden pull factor luring other kinds of oil-related investments to Ghana. These include investments in the manufacturing, general trading, real estate (including building and construction), banking, insurance and the hospitality sectors.

A noticeable change in the direction of FDI flows occurred in the latter parts of the 1990s. For the first time outflows of FDI were recorded from Ghana by UNCTAD (see Figure 3.7). From 1970 to 1995 there were no records of overseas investments by Ghanaian companies. But in 1996, the first significant investment outside Ghana by a Ghanaian company was recorded. The change in the usual pattern of investment flows appears to be part of a trend in SSA whereby other African firms especially from South Africa are expanding to other parts of the continent.

Figure 3.7: Outward FDI Flows from Ghana in Nominal Terms (Millions US$), 1996 – 2009



Source: UNCTAD Statistical Database 2011

In the case of Ghana, the Ashanti Goldfields Company became the first significant multinational enterprise after acquiring gold mines in Tanzania, Guinea and Zimbabwe. Most of these investments took place before Ashanti Goldfields Company (AGC) was acquired by AngloGold of South Africa. Despite the fact that the majority of investment activities overseas have been undertaken by AGC, other Ghanaian companies such as Luki Investment Limited, and individual private investors engaged in relatively small-scale business activities, mainly in the services sector. On average, the volume of investments overseas by Ghanaian investors has been relatively small in comparison to those from other developing countries. Average annual outflows from 1996 to 2009 were US$16.14 million. Figure 3.7 depicts the pattern of outward FDI flows from Ghana from 1996 to 2009.

3.8 Sectoral Analysis of FDI Inflows

The analysis of FDI inflows to Ghana in the preceding section did not distinguish between inflows to the various sectors of the economy. In section 3.4 we examined FDI in the mining sector. In this section we examine the flow of FDI to the non-mining sector. The mining sector was dominated by the gold sector, partly because of its importance in the mining sector and also because information on that industry was relatively easier to obtain. The non-mining sector largely consists of the Manufacturing, Services, Tourism, Building and Construction, Export Trade, Agriculture and General Trade.

Before we continue a brief note on the oil sector is worthwhile. Until recently there was little foreign investment in the oil sector, which has generally been treated differently from the mining sector in Ghana. Prior to the recent interests by foreign investments, the oil sector was dominated by the state oil refinery, the Tema Oil Refinery, the state oil distribution company, Ghana Oil Company, and several large- and small-sized oil distribution and retail companies. Most of the large firms in the oil sector were multinational corporations, such as Shell, Mobil, Total Elf, whilst many of the small- and medium-sized firms were local firms. In the last decade regulation governing the oil distribution sector has been relaxed, with the consequent entry of many medium-sized companies especially from Nigeria playing an important part in the sector. The activities undertaken by these companies have generally been categorised as services, and consequently grouped under the services sector, given that they hardly undertake any kind of production.

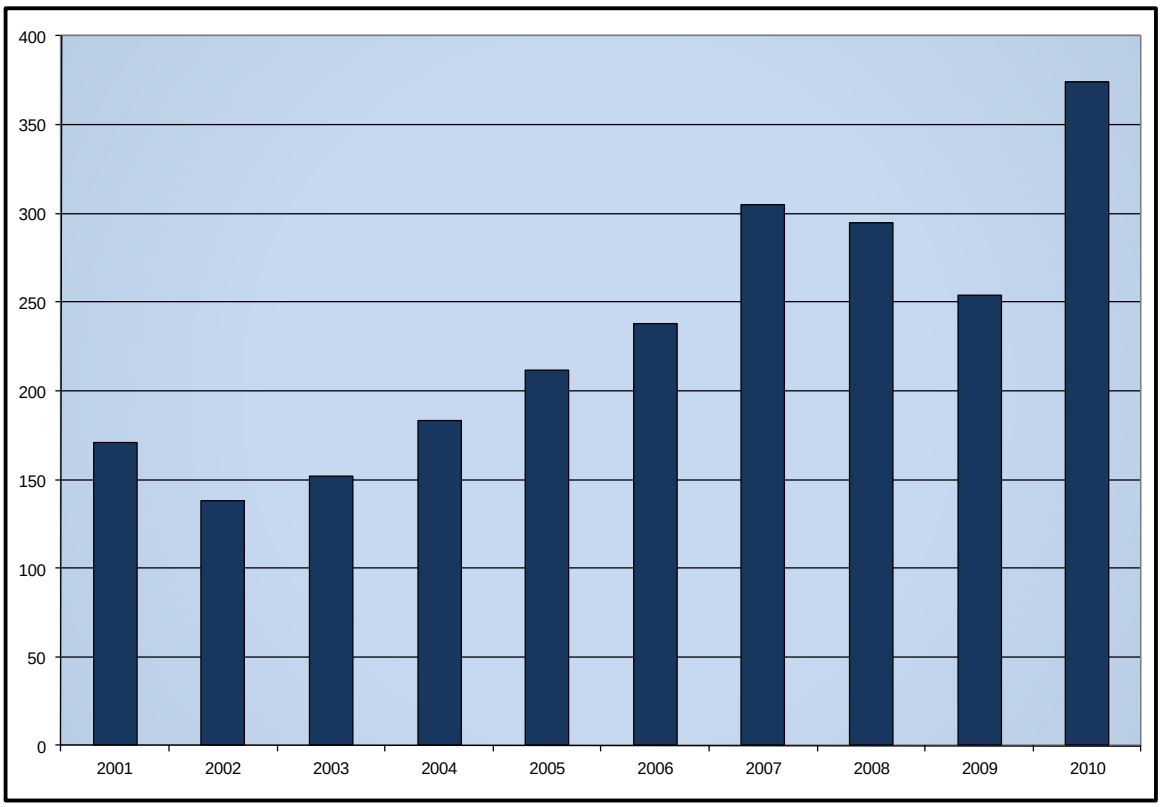
3.8.1 Analysis of Trends in FDI Projects

The Ghana Investment Promotion Centre (GIPC) is the official state agency charged with the responsibility of promoting and keeping track of FDI in the non-mining and non-oil sectors (henceforth the non-extractive sector). As part of this mandate it produces quarterly and annual reports of its activities. Relying on several issues of the quarterly reports by the GIPC we present a sectoral analysis of FDI to the non-extractive sector. The total number of investment projects has risen steadily since 1995. Between September 1994 and December 2000 a total of 1084 investment projects were registered. There is no information on how many of these projects are ongoing

since the GIPC does not provide any data on survival rates of newly-established FDI projects. In Figure 3.8 we present the pattern of total investment projects registered between 2001 and 2010. The pattern reveals a steady and rising trend in the number of registered investments despite the marginal decline recorded in 2008 and 2009.

The decline in 2008 and 2009 can be attributed to the global financial crisis which started in 2007 initially from the United State of America, spreading to Western Europe and subsequently to other parts of the world. The resulting global credit crunch and the slowdown in global economic activity appear to have had a subdued effect on the inflows to Ghana. Thus, by 2009 the full effects of the slowdown in global economic activity and the uncertainties created led to a decline in investment projects. There could be other plausible reasons for this decline in the number of projects after 2007. This decline can also be attributed to the general election held in 2008, and the uncertainties and political tensions that lingered in the months leading up to the election as well as the closeness of the election race may have caused foreign investors to hold back on investments. The sudden increase in 2010 probably supports this argument that foreign investors held back to be certain about the future the direction of the country and the economic policies to be pursued.

Figure 3.8: Number of Investment Projects recorded by the GIPC, 2001 – 2010

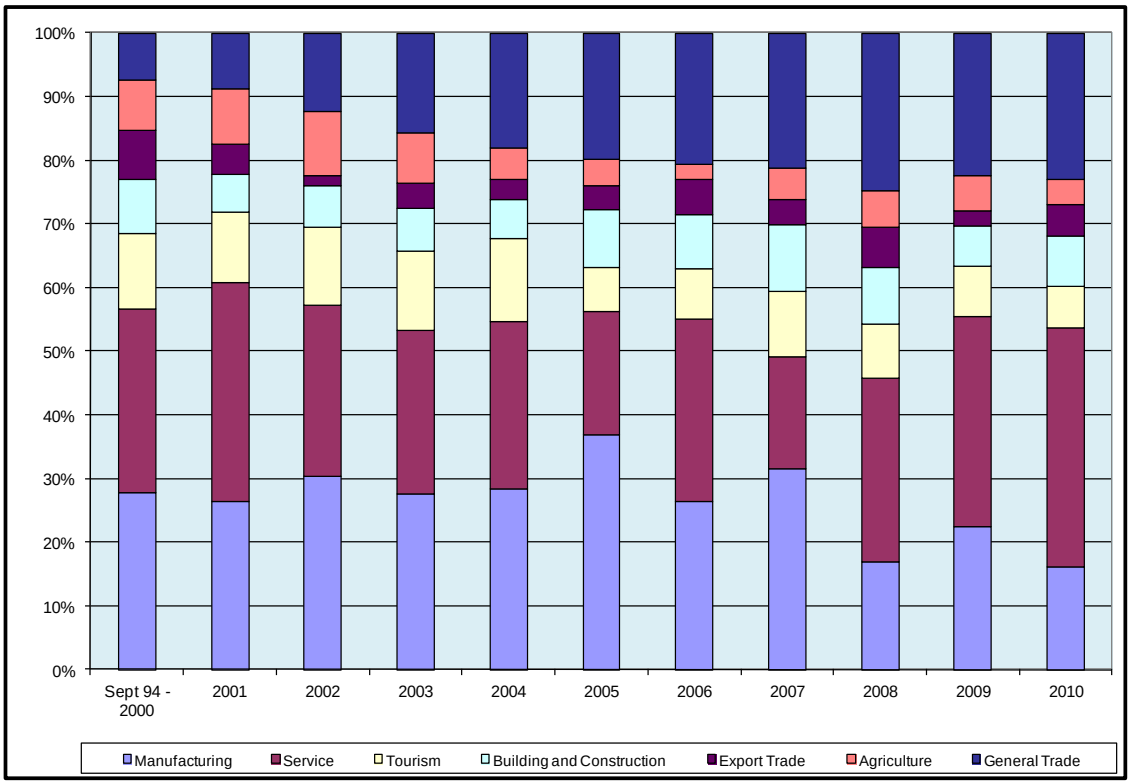


Source: Author's computation based on various issues of the GIPC Quarterly Reports

In Figure 3.9 we present the sectoral breakdown of investment projects to the manufacturing, services, tourism, building and construction, export trade, agriculture and general trade sectors from September 1994 to 2010. By the far the majority of all investment projects have been recorded in the manufacturing and services sub-sectors. Over the period, the two sub-sectors have accounted for at least 50 percent of the total number of projects. See Figure 3.10 for a breakdown of cumulative investment projects from September 1994 to 2010. Over the same period there has been a steady increase in the number of investment projects in the general trading sub-sector. The number of investment projects in the services sub-sector has increased in the last four years, signifying the growing importance of the services sector in the Ghanaian economy. The services sector has accounted for nearly 50 percent of GDP in the last five years. The proportion of investment projects in the building and construction and tourism sub-sectors have remained fairly stable over the same period.

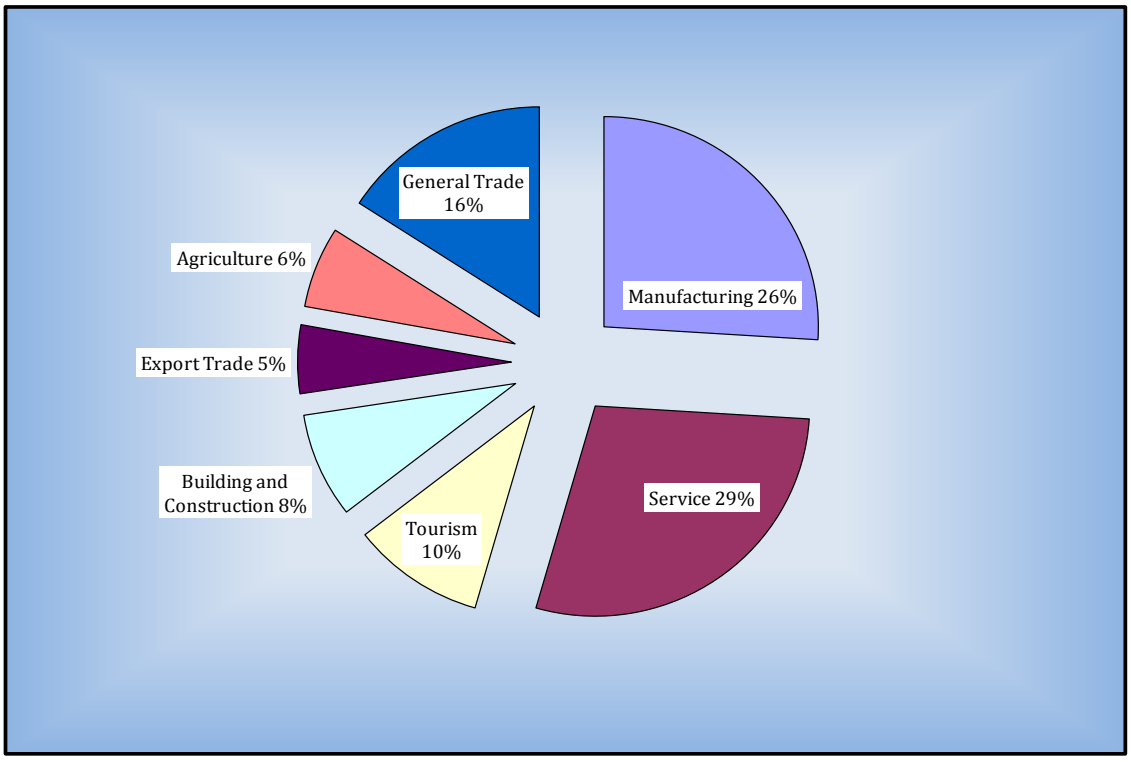
On the other hand, we observe that only a relatively small number of investment projects have been registered in the agricultural and export trade sub-sectors. Given the importance of agriculture and export trade to the Ghanaian economy this trend is disappointing. Cumulatively, this amounted to 6 percent and 5 percent, respectively, for agriculture and export trade (see Figure 3.10). Agriculture accounts for nearly 30 percent of total real GDP, represents one of the strong pillars of the economy and significantly contributes to GDP growth. Hence, considering its relative size and contribution to economic performance, it would be expected that substantial foreign investment would be attracted to the sector. The low level of investments is probably a reflection of the low return on investment in the sector.

Figure 3.9: Breakdown of Total Number of Foreign Investment Projects by Sector, September 1994 to 2010



Source: Author's computation based on various issues of the GIPC Quarterly Reports

Figure 3.10: Cumulative Non-Mining Foreign Investment Projects, September 1994 - 2010



Source: Author's computation based on various issues of the GIPC Quarterly Reports

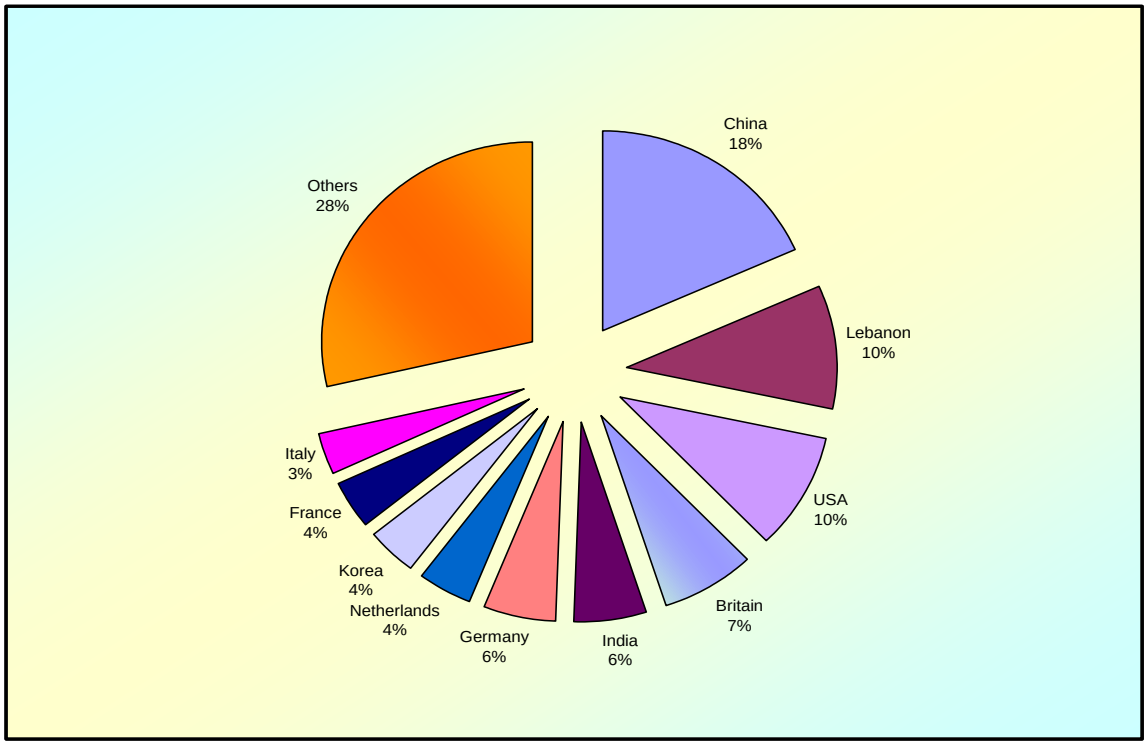
The trend in the distribution of the number of investment projects is also mirrored in respect of the inflows of foreign financial resources (FDI). Since September 1994, the services sub-sector has attracted the largest inflows of financial resources. On average, this approximated 35 percent of total recorded inflows over the period. This pattern can be ascribed to the huge investments witnessed in the telecommunications industry following the deregulation of the sector that was instituted about two decades ago. As UNCTAD (2008) notes, within the service sector, Ghana has attracted significant amounts of FDI to the banking and telecommunications industry.

In a study on the degree of restrictions to FDI in the services sector in 73 developed and developing countries Golub (2009) found that in the case of Ghana, the index was 0.3 for all services. The degree of restrictions was measured on a scale of 0 to 1, 0 = open and 1 = closed. It is thus not surprising that in the last decade there have been large investments in the information and communications technology (as contrasted with telecommunications but certainly related), banking, finance and insurance sectors. The banking sector has in recent years witnessed the influx of new foreign banks especially from Nigeria and South Africa. Following the discovery of oil in 2007, there has also been an increase in investments in the provision of support services to the oil industry.

3.8.2 The Sources of FDI Projects

The sources of FDI projects recorded by the GIPC are varied. From 1957 to the mid-1990s, the major sources of foreign investments were the United Kingdom, Switzerland, (West) Germany, United States of America, the Netherlands, Italy and France. In addition, there were also investors from India and Lebanon who engaged in commercial trading, exports and light manufacturing activities. However in the last two decades this trend has been changing. Since 1994 the GIPC has been responsible for the registration of foreign investment projects. Figure 3.11 presents the cumulative investment projects from September 1994 to March 2007 by source country. This shows that China represents the major source of foreign investment projects, followed by Lebanon, USA and Britain. The other sources of investments are India, Germany, the Netherlands, and South Korea. The sources of investments have however been very diverse. The ‘Others’ category includes countries such as Canada, Belgium, Australia, South Africa, Nigeria, Cote d’Ivoire, British Virgin Islands, Taiwan, and Japan.

Figure 3.11: Cumulative Foreign Investment Projects by Source Country, September 1994 – March 2007



Source: Author's computation based on various issues of the GIPC Quarterly Reports

Since 2007, China has consistently remained the leading source of FDI projects to the non-mining sector. Indeed from 2008 to 2010 the leading source countries of FDI have remained unchanged. Table 3.3 presents the ten major source countries of FDI projects to Ghana's non-mining sector between 2007 and 2010. We observe that China, India, Nigeria, Lebanon, Britain and USA have remained the leading sources of investment projects. The dominance of China and India reflects the growing dominance of these countries in the global economy and their increased involvement in the economies of many African countries. For example, Zafar (2007) reports that Chinese FDI in Africa, which in the early 1990s was approximately US$20 million a year, jumped to nearly US$100 million in 2000. By 2005 this had risen to approximately US$400 million, rising again in 2006 to over US$1 billion. The growing importance of Chinese FDI in Africa is a reflection of what Kaplinsky and Morris (2009) describe as the third and emergent phase of Chinese interaction with SSA. This involves the predominance of small- and medium-sized enterprises in the private sector of most SSA economies, actively involved in the manufacturing and services sectors. The other forms of Chinese investments are the large, predominantly state-owned enterprises that are engaged in resource extraction and infrastructure projects.

Table 3.3: Ten Major Source Countries of FDI Projects to Ghana, 2007 - 2010

2007		2008		2009		2010	
Country	**No of Projects**	**Country**	**No of Projects**	**Country**	**No of Projects**	**Country**	**No of Projects**
China	65	China	52	China	45	China	67
India	49	India	49	India	32	India	48
Lebanon	45	Nigeria	24	Lebanon	23	Nigeria	36
Nigeria	17	Lebanon	21	Nigeria	21	Lebanon	30
Britain	16	Britain	18	Britain	12	Britain	24
USA	9	USA	16	USA	12	USA	13
Korea	8	France	12	Italy	7	Mauritius	8
Netherlands	7	Netherlands	6	British Virgin Islands	7	Netherlands	8
Italy	5	South Africa	5	Korea	6	South Africa	7
Canada	5	Norway	4	Germany	6	British Virgin Islands	6

Source: Author's computation based on various issues of the GIPC Quarterly Reports

But the growing importance of China and India is also a reflection of increasing trade between the two countries and Africa. Trade and investment agreements are largely structured under the South-South cooperation frameworks, which in the case of Ghana involves bilateral trade agreements with three Asian countries, China, India and Malaysia. Trade with these countries has increased significantly in the last decade and with it have come increased foreign investments from China and India in particular. Wang and Bio-Tchane (2008) for example report that trade between African and China increased from about US$10 billion in 2000 to US$55 billion in 2006; exports from Africa and imports from China rose on average by more than 40 percent and 35 percent, respectively. Consequently, China is now Africa's third largest trading partner after the United States and the European Union. The growing influence of India mirrors that of China; trade has expanded in recent years, increasing from US$ 950 million in 1997 to US$2.7 billion in 2005. Broadman (2007: 79) also reports that between 1990 and 2004, India's imports from Africa increased from an annual average of 7 percent between 1990 and 1994, to 14 percent between 1999 and 2004.

In terms of the financial value of investments, the picture is slightly different. Whilst the highest number of investment projects originates from China, and this has remained the case since 2007, in terms of value of projects the source countries have varied over the years. Table 3.4 presents the pattern of investment projects and the value of investment projects by source countries from 2007 to the first quarter of 2011. We present only the top four investments by number of projects and value of investments.

In 2007 for example, the leading source country for investment projects was China, but in terms of value this was Britain. In the first quarter of 2008, India was the leading source country for investment projects, but the United Arab Emirates was the source country for the most valuable investment project. We also observe similar patterns for various quarters of 2008, 2009, 2010 and the first quarter of 2011. What clearly emerges from Table 3.4 is that despite countries such as China and India consistently being the major sources of investment projects, in terms of the value of investment projects there is some variation. We also observe that the value of investment projects vary from year to year, though for the bulk of individual investment projects, the value is usually less than US$2 million.

Table 3.4: Number of Projects and Value of Investments, 2007 – 1st Quarter 2011

Source Country	No of Projects	Source Country	Value of Investment (US$)
Jan – Dec 2007			
China	65	Britain	4676.06
India	49	China	152.19
Lebanon	45	India	23.77
Nigeria	17	Lebanon	14.54
Jan - Mar 2008			
India	17	U.A.E	2119.39
China	16	Nigeria	810.61
Britain	7	India	17.03
Nigeria	7	Lebanon	6.939
Jul - Sep 2008			
India	13	Netherlands	1287.56
Nigeria	10	Nigeria	257.12
China	9	Luxemburg/Germany/US	8.85
France	7	Britain	7.79
Oct - Dec 2008			
China	14	USA	100.19
India	11	India	46.8
Lebanon	10	Norway	40.34
Nigeria	5	France	6.89
Jan - Sep 2009			
China	34	South Africa	116.92
India	26	Nigeria	79.27
Lebanon	19	British Virgin Island	53.32
Nigeria	18	Britain	48.05
Jan - Dec 2010			
China	67	Bermuda	300
India	48	Nigeria	216.04
Nigeria	36	Trinidad & Tobago	168.67
Lebanon	30	China	95.84
Jan - Mar 2011			
India	19	Britain/Belize	70.5
China	13	Lebanon	59.94
Lebanon	10	Mauritania	56
Nigeria	8	Nigeria/Britain	48.16

Source: Author's computation based on various issues of the GIPC Quarterly Reports

The GIPC also registers liaison offices of multinational firms. The function of the liaison offices is primarily to oversee their Ghanaian and West African operations, such as the sales and marketing of products, and other related issues that might arise in the course of the operations of their firms. The number of liaison offices registered between September 1994 and December 2006 was 155. In 2008, 10 offices were registered, with 11 registered by the third quarter of 2010. In the first quarter of 2011, the GIPC had registered 7 liaison offices. In terms of source countries, the highest number of liaison offices registered between September 1994 and December 2006 were from India (25), the United Kingdom (25), Japan (8), U.S.A. (6), Switzerland (6), Denmark (6), China (6), Germany (5), South Africa (5), and Nigeria (5) to list only the top ten source countries.

Another important function performed by the GIPC is to keep a record of technology transfer agreements. These are usually made of licencing agreements for the production of goods, such as Coca-Cola products. However, the technology transfer agreements also involve technical and management services agreements, technical and management services and royalty agreements, and trademark licence agreements. Indeed, between 2001 and 2011, only four agreements have been recorded. The most prominent have been between Coca-Cola international and the Coca-Cola Bottling Company of Ghana, and between Voltic International and Voltic Ghana Limited (a mineral water production company).

3.9 Summary and Conclusion

Over the last 50 years there have been various attempts by previous governments to create a coherent set of policies governing the activities of foreign investors in Ghana. In this chapter we have discussed the evolution of government legislation on FDI, examining the various attempts by governments to develop FDI policy. With the exception of the 1975 Investment Decree, these policies have incorporated several measures and incentives to attract foreign investors. Initial response in terms of FDI inflows was patchy and low especially in the 1970s and 1980s. However, from the mid-1990s inflows began to rise steadily and have substantially risen in the last five years. This has been the result of several factors. These include the launch of economic reforms from the mid-1980s, improvements in FDI legislation, a

new era of democratic governance and an increasingly integrated world economy in which FDI and MNEs play an increasingly important role. Although inflows have risen steadily, these inflows are relatively small by developing countries average.

The consequences of changing economic and political environment from the early 1990s and the associated inflows in FDI have been improved productivity in the gold industry, a growing economy with an expanding services sector, with the telecommunications, banking and finance, real estate, and the hospitality sub-sectors booming. Despite these positive developments inflows to the agricultural sector has been relatively small over this period. Further, investment projects in the manufacturing sector though substantial in terms of numbers are relatively small in terms of value and have therefore not resulted in the rapid expansion of the manufacturing sector. Clearly there is more benefit to be derived from FDI inflows in other sectors of the economy, especially in the manufacturing sector.

The sources of FDI to Ghana have gradually shifted from traditional sources with the changing dynamics of the global economy. Pre-1990s, most FDI came from Europe and the USA. However, since the mid-1990s inflows of FDI have increasingly been dominated by Chinese and Indian investors reflecting the growing importance of these countries in the world economy. Other sources of investment include Nigeria, Lebanon, Britain, France and the USA. Consequently, there is wide variation in the sources of FDI to Ghana. Inflows have also been rising steadily, and in the last five years the inflows have been dramatic. With the discovery of oil in 2007, there is an increased likelihood for an increase in FDI inflows in the future. But if history serves as a guide, then as in the case of the gold industry, the oil industry is likely to be the greatest beneficiary.

What conclusions can be drawn from these trends? As we observe from the trends in FDI inflows pre-1990s, being resource-rich does not guarantee substantial flows of foreign investments. Indeed during these years, FDI inflows were relatively small and volatile. In years when policy appeared too hostile or the political environment was very unstable, there were significant capital outflows. This underscores that natural resources cannot be the only determining factor in attracting FDI. Other factors play a role in ensuring the competitiveness and attractiveness of a country to foreign investors.

The lesson from analysing the evolution of these policies is that where policies leave investors uncertain about the return to and the safety of their investments, the response is low. Policies are needed at the industry, sector and national level, which provide clear guarantees to investors whilst at the same time creating national competitive advantages. Nonetheless, there is more to just putting policies in place via legislation alone. There is the need for strong government support, a stable and open political environment, and a strong and diversified economy. These are by no means exclusive and do not necessarily result in large flows of FDI. However, they provide the necessary conditions, which serves to raise the attention of foreign investors to a country.

With increased inflows raises the question of how to effectively ensure the country maximises the benefits of FDI, whilst at the same time ensuring that legislation is sufficiently dynamic and robust to take advantage of the changing nature of the global economic environment and the very changing patterns of global FDI flows and characteristics. This is generally a hard act to achieve, but it is imperative if these relatively small investments, which hopefully can become larger investments in the future, are to play an important part in the transformation of the economy and stimulating economic growth and development.

Chapter 4

Methodology

4.0 Introduction

In this chapter our primary objective is to discuss the methodological approaches used in conducting fieldwork in Ghana. This is guided by the main objective of this study, which is to explore the extent of technology transfer undertaken by foreign direct investment (FDI) firms in Ghana's manufacturing sector. A secondary objective of this study is to explore the exporting activities of FDI manufacturing firms. To recap, we noted earlier in Chapter 1 that this is a country case study on Ghana, the purpose of which is to explore the technology transfer activities of FDI firms in the manufacturing sector. Hence, the principal subject of analysis in this study is FDI manufacturing firms. The consequence of such a narrow focus on FDI manufacturing firms is that other (non-FDI) firms in the manufacturing sector are excluded.[21] Moreover, FDI activities in other sectors, such services and agriculture, are not considered.

This apparent weakness in our research approach, with regard to the emphasis on FDI firms, is addressed by utilising information available from other surveys on the Ghanaian manufacturing sector. These surveys are the Ghana National Industrial Census, the Regional Programme on Enterprise Development and Ghana Manufacturing Enterprise Survey (RPED and GMES), the United Nations Industrial Organisation (UNIDO) Foreign Direct Investor Perceptions survey of 15 sub-Saharan African countries, and the World Bank Enterprise survey (WBES) on Ghana. Thus, information on domestic and foreign manufacturing from these surveys will be used as comparative data and to investigate the reliability of our survey results and findings. In order to provide clear guidance on the issues discussed in this chapter, we first define a few key concepts and terms.

[21] We will refer to non-FDI firms as domestic firms.

4.1 Terms and Concepts

4.1.1 The Firm

The principal subject under investigation is the firm. As an economic institution or establishment, the firm represents that vital organisational entity within an economy that is engaged in the transformation of inputs (resources) into outputs (mainly products or services). But perspectives on the firm vary. Coase (1937, 1990: 34-37) for example argues that the key features of a firm are that it involves the organisation of factors of production and the coordinating functions by entrepreneurs and managers. And this kind of coordination could be carried out by the one-person or *unitary* firm where the same individual owns all inputs used to produce an output (McNulty 1984), or as in the case of most modern economies, "a coalition of resource or input owners" (Eggertsson 1992: 160-162). Penrose (1980: 9-16) describes the firm as the basic unit for the organisation of production, through which a greater part of economic activity is channelled; it is a complex institution affecting economic and social life in several ways. Furthermore, as a physical entity, it is not an observable object separable from other objects hence the difficulty in defining it, except with reference to what it does or what is done within it. However, very essential character of a firm is that its activities are carried out within an administrative organisation, particularly in the case of modern industrial firms.

Another character of the firm, and one which has been ignored by economists in recent times, is its legal nature (Hodgson 2002). As we noted in the preceding paragraph, the firm is an organisation involved in decisions that affect social and economic life in the environments in which they operate. But as a distinct organisational form the firm is organised around legal and political institutions. Thus, the firm becomes a legal entity; it is created by the law as a fictitious person (Slorach et al. 2007). As Hodgson (ibid) argues, this fictional creation meant that contractual considerations that applied to individuals would also apply to firms. Firms can therefore enter into contractual agreements that were binding in law and could sue and be sued just like individuals. The legal status of firms in countries is usually derived from the laws governing the formation of companies. Masten (1988) reinforces this point when he notes that as an institution the existence or boundaries of the firm are defined and administered by an exogenous authority.

But it appears that over the years the legal character of the firm has been ignored by economists in most discussions and studies on the firm. Hodgson (2002) for example writes of the diminished interest of the firm as a legal entity by economists. He notes that the notion of the firm in economics has become dangerously devalued of legal meaning. Consequently, most economists have ignored the essential legal element in the definition of the firm and instead treated the firm as a production function. This has therefore shifted the idea of the firm as a legal structure to a locus of production. And the absence of a clear, legally grounded definition of the firm has resulted in conceptual difficulties in proclaiming a clear definition of the firm.

In this research we view the firm as both a legal and economic entity with a coordinating and organisational ability engaged in production with the objective of exchanging such output for money (profit). Whilst the concept of the firm from our research perspective is clear, we need to clarify what in practice we had to deal with. We recognise that some firms will have all aspects of their activities situated at a single location. This, for example, is the case where a firm might have the legal-managerial-organisational section and production plant(s) all located at one place. But this may not always be the case. At other times however, the production plant(s) may be at different locations from the managerial-organisational section. Although these various sections are essential to the operation of a firm, the section to which we directed our queries and where formal interviews were conducted was the legal-managerial-organisation section.[22] This section of the firm therefore represents the reporting unit (of the firm) in this research.

Finally, it is important to emphasise that in the selection of FDI manufacturing firms to be surveyed, the size of firms did not form part of the selection criteria. Several firm surveys (such as the RPED and GMES) attempt to survey a wide range of firms, and one of the prominent characteristics used is the size of firms. In our survey, the only criteria for selection were the status of the firm; these were that a firm be classified under the manufacturing sector and be established as a result of FDI or be a recipient of FDI. We also do not delve extensively into the organisational or engineering aspects of firms' operations and management. However, these aspects of firm operations and management will be captured by the questionnaire and

[22] We however need to add here that not all interviews were conducted at the legal-managerial-organisational section of firms. In ten cases, interviews were conducted at a plant because the appropriate top level manager to interview operated from there.

consequently discussed in the analysis section. Although deeper analysis of this would throw up very interesting insights, it is unfortunately outside the scope of this research.

4.1.2 Firm Size

We have already stated that firm size was not a factor in the selection of our sample. Nonetheless, firm size has tended to play an important role in surveys of firms, particularly when these surveys have focused on specific types of firms, such as small- and medium-sized firms. An example is the GEMINI[23] survey, which was primarily focused on small- and medium-sized enterprises. Smyth et al. (1975: 3) also observe that "much of the empirical work in industrial and microeconomics involves the use of measures of firm size". But there is no general consensus as to how firms should be categorised according to size. Various countries and regions of the world have different methods of firm size classification. Ingham (1970: 63) for instance, laments the wide variations that existed in the classification of 'large' and 'small' sizes in some empirical studies, noting the existence of arbitrariness in such classifications.

But the problem usually lies in the classification of firms as either small- or medium-sized. Large-sized firms are therefore those that are not classified as micro, small or medium. Goldin (2005: 20-36), for example provides a good discussion of the debate concerning the classification of small- and medium-sized firms and further presents the various classifications used by the OECD, World Bank and several Eastern European countries (see Appendix Table A. 1). Her arguments highlight the variations that exist in the classification of firms by size by various countries and by different international organisations.

With regard to the arbitrariness in the classification of firm sizes, Ingham (*ibid*) suggests that size classifications for firms must be informed by a theoretical framework. In this respect, (Smyth et al. 1975: 7-8) presents three theoretical approaches for the classification of firm size. These consist of, (a) inputs in the productive process, such as number of employees, the labour input, and some measure of assets representing the capital input; (b) outputs – physical output and sales; and (c), measures of the value of a firm, such as stockholder's equity. They further argue that in some instances theoretical

[23] GEMINI is the acronym for Growth and Equity through Micro-enterprise Investments and Institutions. It was a six-year applied research, development and services project of the Bureau for Private Enterprise, USAID from 1989 to 1995.

considerations make it clear which measure is appropriate but this measure may not be available for practical reasons. For example, firms may not be reporting performance indicators such as, sales, profits and employment, because they are not legally bound to do so.

In most empirical studies on African manufacturing, employment measures have proved the most popular and probably most convenient and reliable measure of firm size. The difficulty in using other measures of size is further highlighted by (Smyth et al. *ibid*). For example, they argue that if sales values are used as a basis for size classification, it is probable that firms are likely to publish sales values in years of strong performance and not publish them when performance is poor. Sales values may also reflect seasonal effects and large discrepancies across sectors, thus rendering their use as a measure of size unreliable. The use of profits is also problematic because in theory and practice, profits could be negative and does not serve as a satisfactory measure. The use of physical output is also unreliable because of the problem of comparability across industries. Equity estimates are also usually available for listed companies and where only a few companies are listed this becomes a biased measure for firm size.

As a consequence the tendency has been to use whichever measure of firm size is conveniently available. The core issue of this research is however independent of firm size, as the question at stake is an exploration of the extent of technology transfer activities undertaken by FDI manufacturing firms. In classifying firm size, we opted for a pragmatic and convenient approach, thus relying on reported employment levels by firms as the basis for categorising firm size.

4.1.3 Foreign Direct Investment

One of the distinguishing aspects of this research is the effort to distinguish ownership characteristics of firms from foreign direct investment. Several studies on Africa, for example, (Harvey and Abor 2009; Abor et al. 2008; Söderbom and Teal 2000, 2001a & c, 2003; Teal 1999; Bigsten 1998) have tended to characterise any form of foreign participation in firms as presence of FDI. But this approach in our view is unsatisfactory, primarily because ownership by and/or management presence of foreigners (i.e., non-nationals) is not conclusive that FDI is present. Some of these

foreigners may have resided in the host countries for a considerable period of time and may have started a business using finance from domestic sources, or may have joined a firm to provide expertise either on contract or as part of technical assistance with donor governments/agencies. In these circumstances it will be inappropriate to classify the mere presence of a foreigner in a firm as FDI.

This observation however reveals one aspect of the difficulty in defining what constitutes a foreign direct investment entity, and related to that, foreign direct investment. Graham and Krugman (1991: 7-8) for instance argue that the very definition of FDI poses serious problems because the intended measure is the extent to which foreign firms and individuals control production in another country. As a result the question of the nationality of 'foreign firms' and what constitutes control becomes an issue. The difficulties that arise have to do with defining nationality of foreign firms and what constitutes control. The dilemma with nationality particularly for a foreign firm arises when it produces in more than one country or as an organisation, its activities sprawls across national boundaries. A way out is to use the central headquarters or the "centres of gravity" of the firm as the basis for determining nationality. With regard to control, this is usually measured by the share of ownership in a firm, usually 10 percent or more of equity. That is, if a single foreign individual or firm acquires a stake of at least 10 percent in a domestic firm. Whilst this might seem a straight forward approach, (Graham and Krugman 1991: 8-9) highlight the possibility where "several individual foreigners could together have 80 percent stake in a firm although individually they may each have less than 10 percent, and may also not act as a pre-organised group".

On a separate issue Graham (1995: 1) observes that the "term FDI is itself a misnomer largely on account of the investment in the term". He argues that in several instances what is recorded as FDI it is not an investment in either an accounting sense – whether financial or balance of payments accounting – or in an economic sense. He argues that in accounting terms FDI takes place when the book value of the net worth of an investment increases. Such an increase can be the result of a change in the net worth of the firm occasioned by the transfer of ownership of part of an ongoing domestic firm to a foreign. However this increase in net worth, recorded as FDI does not involve any capital expenditures in the home country. To him this "misnomer" arises because of the differences between the *source of funds* and the *use of funds*. For most firms, what is measured or considered as FDI is really a source of funds, such as

new equity in an existing domestic firm, increase in the net worth of foreign investors, increase in the paid in capital of foreign investors in an ongoing firm, and retained earnings by subsidiaries of MNEs. However these *sources of funds* do not necessarily correspond to real capital formation as they do not represent capital expenditures – arising from the *uses of funds* – which correspond roughly to the economists' concept of real investment.

The issues regarding the definition and the term aside, FDI also embraces two related but different sets of topics or activities – international finance (macro view) and industrial organisation (micro view) – (Lipsey 2001b; Graham 1995). These two perspectives on FDI are in turn explained by different theories and by different branches of economics, (Lipsey 2001b). Consequently, FDI can be measured at both the macro and micro level.

At the macro level FDI is reported in balance of payments statistics as a particular form of capital flow across national borders, from home countries to host countries, (Graham and Krugman 1995: 11; Lipsey 2001b). Thus, foreign direct investment flows consist of equity capital: shares owned by the foreign direct investor in its affiliate firms; retained earnings: the foreign direct investor's share of earnings not distributed as dividends by affiliates or earnings not remitted to the parent company; and intra-company loans or intra-company debt transactions, referring to short- or long-term borrowing and lending of funds between the parent company and affiliated enterprises, (Jensen 2008: 8-9; Athukorala 2007: 26; Dunning 1996; IMF 1993: 87; Frank 1980: 8). The use of this approach to measure FDI is not without its shortcoming. Not all countries record every component of FDI flows. For instance, in a lot of countries data are available for the first and third, with very little information on the second constituent of FDI, retained earnings (Athukorala *ibid*). For a good discussion of some of the problems associated with the measurement of FDI see (Stephan and Pfaffmann 1998; Bellak 1998).

From the micro perspective, FDI can be viewed as an entity associated with the activities of multinational enterprises (MNEs). As we have already noted in Chapter 2, the activities of multinational enterprises also give rise to FDI, either because they establish subsidiaries in other countries or because they take over the operations of an on-going domestic firm. The foreign direct investment entity (e.g., subsidiary or joint-venture) is thus viewed differently from the aggregate flow of funds described in the

balance of payments statistics. For instance, a foreign direct investment entity or enterprise is defined in the IMF's Balance of Payments Manual (IMF 1993: 86) as "an incorporated or unincorporated enterprise in which a direct investor, who is resident in another economy, owns 10 percent or more of the ordinary shares or voting power (for an incorporated enterprise) or the equivalent (for an unincorporated enterprise)". Thus, a foreign direct investment entity can be identified based on the extent of direct managerial control exerted by a foreign investor in the management of a domestic firm. This therefore throws up the possibility that the foreign investor may in fact be acting entirely as an individual. In other words the foreign investor may not be associated with a multinational or any other enterprise operating in another country. Such an investor can therefore be characterised as a foreign entrepreneur, as opposed to a domestic entrepreneur.

The implication from the preceding paragraph is that a foreign investor by exercising direct managerial control must therefore have a long-standing relationship with the firm. Foreign direct investment will thus imply a long-term interest by foreign investors in a domestic enterprise. The idea that FDI connotes a long-term interest in the operations of a business entity located in a country different from the nationality of the investor is seen in the definitions provided by the IMF and the OECD. The IMF Balance of Payments Manual (IMF *ibid*) defines foreign direct investment as that "category of international investment that reflects the objective of a resident entity in one economy obtaining a lasting interest in an enterprise resident in another economy".[24] Closely related to this definition provided by the IMF is that of the OECD. The OECD (2008: 48) defines FDI as:

> *Investment that involves a long-term relationship reflecting a lasting interest of a resident entity in one economy (direct investor) in an entity resident in an economy other than that of the investor. The direct investor's purpose is to exert a significant degree of influence on the management of the enterprise resident in the other economy. Direct investment involves both the initial transaction between the two entities and all subsequent transactions between them and among affiliated enterprises, both incorporated and unincorporated.*

The common strand in these two definitions is that of long-term lasting interest and control (or the ability to influence decisions) of the direct investment entity.

[24] The resident entity is the direct investor and the enterprise is the direct investment enterprise.

In respect of studies of firms, Singh and Marjit (2003: 1) describe FDI as a situation where "a firm owns plants and equipment, employs local labour and produces in a foreign country". They do not explicitly state if this firm is a MNE, although such a description fits the activities of MNEs. But as Jones (2005: 5) observes, the "distinguishing factor about direct foreign investment is control". He argues that FDI involves management control, usually though not exclusively by MNEs.

The activities of MNEs also give rise to two kinds of FDI within the literature on *new* trade theory. A distinction is made between horizontal FDI and vertical FDI. Horizontal FDI arises because of the activities of MNEs that produce the same goods and services in multiple countries (Markusen 1984), and thus serve the host country market, the home country market, and other foreign markets (Helpman et al. 2004). On the other hand, vertical FDI, arises when MNEs geographically fragment production by stages in order to access specific resources not available elsewhere (Helpman 1984).

With regard to how FDI may arise in host countries, Jensen (2008) distinguishes between two forms of FDI; greenfield investments, where multinationals corporations establish subsidiaries in foreign markets, and brownfield investments that arise through mergers and acquisitions, or through privatisation programmes. Whilst the former has been predominant in many developing countries, the latter is now emerging as another form of FDI in developing countries. UNIDO (2007) identifies another form of FDI to sub-Saharan Africa, the foreign entrepreneur. These are foreign-owned and operated firms that are not subsidiaries of a foreign-based enterprise but are owned and operated by a foreign entrepreneur. But it is possible that these foreign entrepreneurs might fall into the same category of *foreign investors* we have described earlier.

In the Ghanaian context we find that various state organisations have different definitions regarding FDI. The Ghana Statistical Service does not provide any definition of FDI activity. Foreign activity is derived using the nationality of the owner of the firm. In this regard, firms are classified as *Ghanaian* and *non-Ghanaian* whereby *non-Ghanaian* is subsequently categorised as constituting FDI. The Ghana Free Zones Board also follows a similar approach to the Ghana Statistical Service in classifying firms. On the contrary the definition used by the Ghana Investment Promotion Centre (GIPC) proved most useful in describing firms as either FDI or not. The GIPC Act provides a definition for direct investment. This is defined as "… investment made to acquire a lasting interest in an enterprise operating in the economy of Ghana and

intended to give the investor an effective control in the management of the enterprise". This definition however does not indicate how much equity a foreigner must have to exercise effective control. Nonetheless, there is mention of the minimum level of equity a foreigner must have.

Section 19 of the Act outlines the minimum foreign capital requirements for foreign participation in enterprises registered by the GIPC. In the case of a joint enterprise with a Ghanaian, the foreigner's share of equity should not be less than $10,000 in foreign capital or its equivalent worth in capital goods. However it is not possible to estimate what percentage of total equity $10,000 is or will be for any such joint enterprise. In situations where the enterprise is wholly owned by a foreigner an amount of $50,000 in capital or its equivalent in capital goods is required by way of equity. If on the other hand the enterprise is a trading concern, involved in the purchase and sale of goods, wholly owned or partly owned by a foreigner, the minimum amount of foreign capital to be invested is $300,000 worth of goods by way of equity capital.

Significantly mention is made in the Act of *foreign capital*. Foreign capital is defined as "convertible currency, plant, machine, equipment, spare parts, raw materials and other business assets other than goodwill that enter Ghana with no initial disbursement of Ghana's foreign exchange and are intended for the production of goods and services related to an enterprise to which this Act is applicable". This therefore suggests that firms registered by the GIPC can be safely defined as foreign direct investment enterprises, and it was therefore the list obtained from the GIPC which served as the primary list from which to develop the entire list of FDI firms.

In general, we observe that FDI is usually associated with the activities of multinational enterprises, involves the ownership of production activities in a nation different from that of the parent company, direct investor or the foreign investor who has at least a 10 percent share in the equity of an ongoing concern thus giving the foreign investor a say in the managerial decision-making at that firm. What we aim to achieve in this research is to identify firms that can be defined as foreign direct investment entities. These include firms that have changed ownership as a result of privatisation or joint ventures, foreign corporations, subsidiaries of multinational corporations, firms in which foreigner investors have at least 10 percent equity and firms that have been established by individual(s) or groups of individual foreign entrepreneurs.

4.1.4 Technology Transfer

Technology is an important aspect of the production process, especially in firms, and new technologies are generally associated with the innovative activities by firms. It is also a generally accepted that FDI results in the transfer of new technologies to host countries. The central theme of this research is to explore the extent of technology transfer resulting from FDI activity. However, as we have already noted in Chapter 2 the term technology is rather nebulous, and therefore an assessment of the extent of technology transfer is a difficult task. In this section we attempt to weave through this maze surrounding the meaning of technology in order to come up with measures that will permit an empirical assessment of the extent of technology transfer activities associated with FDI manufacturing firms.

Technology can mean several things to several people and in different contexts. Chen (1996: 181) for instance points out the inherent conceptual complexity involved in defining *technology* and *technological transfer* in practice. Enos (1989: 2) also notes the wide variations in definitions for *technology* and *technology transfer*. But in order to study appropriately how technology transfer takes place, we need to confine our understanding of technology in a more tractable way. Because in the absence of a clear definition and/or understanding this research might stray out of focus with potentially misleading conclusions drawn regarding FDI activity and technology transfer.

Blomström and Kokko (1998) notes that modern technology can be interpreted broadly to include product, process, and distribution technology, as well as management and marketing skills. In the narrowest sense, (Enos *ibid*: 3) defines technology as technical information contained in patents. This definition allows for ease of measurement, with the number of patents providing a standard indicator. He further expands this definition to include technical knowledge communicable in written form. Thus, to patents are added textbook and technical reports, blueprints and operating manuals, technical knowledge embedded in machines and incorporated in human beings and their institutions. This definition can further be broadened to include facilitating institutions such as procedures, conventions and rules-of-thumb.

Another broader concept of technology or *technological knowledge* provided by Nelson and Winter (1982: 60), relates to the production process in firms. Technological knowledge, or the knowledge about how the firm transforms inputs into outputs, suggests that this type of *knowledge* connotes "knowledge of a way of doing

something". This type of knowledge about the production process may thus be identified with a "book of blueprints or with the knowledge of engineers and scientists". Therefore by implication, technological knowledge is both "articulable and articulated" implying one could look it up if one had the appropriate training. From another perspective, it could refer to a class of knowledge about specific products or production techniques including technical skills necessary to produce a product or use a production technique, (Erdilek and Rapoport 1985) cited in Chen (1996: 181).

The second aspect of technology relates to the production process. However this refers more to the use of knowledge in the production process as contrasted from a technique in the production processes. On the issue of a technique in the production process, the question is whether a production process is excessively capital intensive or not, and whether products produced are sophisticated and highly designed. In the case of developing countries, there is usually concern regarding the appropriateness of the production processes used by foreign firms. These production processes have generally been regarded as excessively capital-intensive in view of the relative abundance of labour.

In this research, technology will encompass product development, production techniques, technology embedded in equipment or machinery, technical knowledge, and managerial and marketing skills. In other words, we consider technology to constitute product and process technology – the physical technical improvements relating to all aspects of the production process – and technological knowledge, embedded as skills and knowledge in foreign management expertise. The latter, because it is tacit in nature, requires some form of training or learning to acquire.

The transfer of technology involves the transmission of knowledge from one entity or person to another. But the means by which this takes place could vary and be dependent on the type of knowledge to be transferred. Buckley et al. (2006: 155) describes the transfer process (of technology) to consist of knowledge communicated from one agent to another, such as from one part of a multinational enterprise (MNE) to another part of the firm. This is however an example of transfer from a parent company to its subsidiary either in the same country or another country. However, where companies have been set up by private entrepreneurs with no MNE involvement, we might expect the transfer process to be in several forms. These will include training – in

the form of formal, informal and on-the-job instruction – adaptation and copying or imitation.

Nonetheless, the measurement of any transfer of technology is subject to the problem of identification. Several surveys have attempted to measure the extent of technological innovations undertaken by firms. Examples of such surveys include the Manheim Innovation Panel survey and the Manheim Innovation Panel – Service Sector survey, which is carried out on German firms employing at least 5 persons. In both of these surveys the indicators used to measure innovation by firms are product innovations, expenditure on innovations, and expenditure on R&D. Other measures employed in several empirical studies include the number of licences and patents a firm has acquired from another firm or institution, the number of patents a firm possesses (through its own research and development activities), activities related to R&D, and expenditures and activities relating to training and upgrading of the labour force in firms, especially in managerial and technical skills.

But which activities by firms (especially FDI firms) constitute technology transfer and which ones do not? This problem of identification clearly has implications about the validity and reliability of any empirical results that emerge. As previously stated, within the context of this research, technology will encompass product development, production techniques, research and development activities, technology embedded in equipment or machinery, technical knowledge and managerial and marketing skills; these can be broadly categorised into two aspects, product and process technology, and technological skills and knowledge. Hence, for the purposes of this research, when we use technology transfer, we mean activities undertaken by FDI firms that involve the introduction of product and process technology and skills and technological knowledge. But the challenge of an empirical investigation into technology transfer by FDI requires an appropriate measure of what exactly constitutes technology transfer. Unfortunately, there are no easy solutions to this question.

The use of case studies probably represents the best approach to obtain a more insightful understanding of whether and how the transfer of technology takes place within firms and industries. In the absence of this, we are left to unravel the perplexities and potential difficulties involved in investigating the issue of the transfer of technology by FDI firms by asking simple questions. The use of simple questions to tease out the extent of technology transfer activities taking place does not entirely

resolve what we anticipated to be a very difficult task in measuring technology transfer. We also anticipate that questions relating to the development and use of technology and related activities, such as, R&D will be viewed by firms as too intrusive, and they may therefore be less likely to cooperate on such questions. In spite of these apprehensions, we considered the approach of asking simple, close-ended questions as both pragmatic and less intrusive, and therefore unlikely to result in top level managers being evasive or uncooperative when answering such questions during interview sessions.

In the light of our discussions so far, we devised specific questions to ask with regard to technology and the transfer of technology in the activities of firms. These are reproduced in Table 4.1. There were also follow-up questions on whether products associated with technology improvements were exported. All such questions had "Yes," "No" and "Don't know" response options. We define questions A, C, E, G, and H to be those activities undertaken by firms that result in the transfer product and process technology, whilst questions I, J, K, and M to S relate to activities resulting in the transfer of technological skills and knowledge. Thus, one set of questions captures the activities of firms relating to product and process technology with the other set capturing activities relating to technological skills and knowledge.

Technology transfer is thus defined to include activities undertaken by FDI firms that result in the introduction of new products, improvement in an existing product, development of a new product, improvement in an existing production process, and the introduction of new production technology in the firm, which we termed product and process technology. It also encapsulates those other activities relating to the provision of training (principally, formal training) to employees, which result in the transfer of technological skills and knowledge. Where FDI manufacturing firms behave in a manner that leads to these activities being undertaken we consider that to constitute the transfer of technology.

Table 4.1: Questions Relating to Technology Transfer Activities by Firms

Q. Did the firm/introduction of FDI lead to the following activities? …

A. Introduced a new product(s)?
C. Improved an existing product?
E. Developed a new product?
G. Improved an existing production process?
H. Introduced a new production technology in the operations of the firm?
I. Introduced new marketing techniques?
J. Developed a new market(s) overseas?
K. Developed a new market in Ghana?
L. Undertake any Research and Development expenditure between 2008 and 2009?
M. Introduced an in-house training programme for Ghanaian Staff?
N. Provide Formal Training for Ghanaian staff on Marketing Techniques in Foreign Market(s)?
O. Provide Formal Training for Ghanaian staff on Operational/Production Management?
P. Provide Formal Training for Ghanaian staff on Organisational Management?
Q. Provide Formal Training for Ghanaian staff outside the establishment, but in Ghana?
R. Provide any mentoring of Ghanaian staff by foreign staff in the firm?
S. Provide any form of Informal Training for Ghanaian staff?

Source: Extracted from Survey Questionnaire (see Appendix A.2 for questionnaire)

4.2 The Context of the Research

4.2.1 The Existing Datasets

One of the major problems confronted by many researchers in Africa is the absence of good, comprehensive, recently dated and publicly available panel data or longitudinal micro-surveys that could be used to undertake research. Researchers are thus confronted with the option of carrying out their own surveys or relying on existing datasets with their attendant shortcomings. In the case of Ghana, and the manufacturing sector, there are existing datasets with varying degrees of detail and relevance. Prominent among the surveys on the Ghanaian manufacturing sector are the Regional Programme on Enterprise Development and Ghana Manufacturing Enterprise Survey (RPED and GMES) 1992-2002 carried out by the Centre for the Study of African Economies (CSAE), Oxford University and Ghana Statistical Services; the National

Industrial Census 2003 carried out by the Ghana Statistical Service; and the Foreign Direct Investor Perceptions in Sub-Saharan Africa: FDI Survey 2005 carried out by the United Nations Industrial Development Organisation (UNIDO) in 15 sub-Saharan African countries.

4.2.2 Oxford University (CSAE) RPED and GMES Dataset

The Oxford University CSAE (RPED and GMES) dataset is a panel dataset on a sample of firms within the Ghanaian manufacturing sector. The data have been collected over the period 1991 – 2002 in a series of seven annual surveys, referred to as Waves I – VII. However, the only publicly available datasets are for waves I to V. These are available at the CSAE website.[25] The questionnaires used for various waves of the survey have been relatively consistent. And though their sample size is relatively large, the surveys were not carried out nation-wide. The first wave in 1992 consisted of a survey of 200 firms drawn randomly from the 1987 Census of Manufacturing Activities. Though the first survey was in 1992 data was also collected for 1991. The firms selected were intended to be representative of the size distributions of firms across the major sectors of the manufacturing sector in Ghana. The survey was carried out in four localities, Accra, Kumasi, Cape Coast and Takoradi. These are major population and business centres in Ghana, with over 90 percent of manufacturing activity located in these locations.

Over the period of the survey, firms that had dropped out of the survey for various reasons were substituted by firms of similar characteristics. The CSAE panel data thus have information on 191 firms from all the seven rounds. On the whole however, it represents an unbalanced panel on 312 firms over the 12 year period, that is, from 1991 to 2002.[26] The objective of the RPED and GMES surveys was oriented towards achieving an elaborate set of firm level data on location, sales and profits, capital investment decisions, employment, perceptions of the investment and political environment in which firms operated and a supplementary survey on a sample of

[25] The CSAE website, http://www.csae.ox.ac.uk/datasets/Ghana-rped/Ghmain.html accessed on 20th March, 2011 still did reveal an update to the datasets on Ghana.

[26] A balanced panel dataset is one that has information on every unit of measure and for all the years or periods for which information is collected. In the case of an unbalanced panel dataset some of the units of observation have information for each of the periods, whilst others do not. Moreover, in subsequent periods for which information is gathered, some of the units of observation would have been dropped whilst new units would have been included.

workers in each firm. The dataset represents a very good and comprehensive source of information on different but related aspects of firm performance. Despite being limited to a few sub-sectors of the manufacturing sector,[27] the questionnaire sought responses on competition and regulation environment firms faced, technology, infrastructure conditions faced by firms, labour and financial markets. The seven waves of the survey involved the collection of both firm level information and detailed information on a sample of workers in the firm.

In spite of these stated benefits of the dataset, there are a few shortcomings. There is no explicit information on FDI within the data, and neither is there information on technology transfer that can be attributed to FDI activity. It is usually the case in most empirical studies on Africa that FDI is measured as the presence of foreign participation in the operation of the firm, particularly in respect of ownership. But as we have argued in Chapter 1 this approach is inadequate. Foreign presence either in the ownership, management structure or production decisions within firms does not necessarily denote FDI.

Another issue is that of technology transfer. On this aspect too there is inadequate information within the dataset. The assessment of the extent of technological activity can only be inferred via the expenditures on equipment by firms. These capital expenditures, which involve the purchase of new, old or 'mixed' – probably a combination of old and new – equipment, are, according to the questionnaire, intended to add to capacity, replace old equipment, or improve productivity, quality of output, or introduce new output.

Given these shortcomings in the CSAE dataset, especially in respect of information on FDI and technology transfer, it will be difficult to rely on these measures to assess effectively the impact of FDI and the transfer of technology within firms. Furthermore, the publicly available dataset from the CSAE is up to 1998. Between then and 2008, we believe a lot must have taken place in relation to FDI in Ghana, and the CSAE dataset will not permit a very good analysis of FDI within the Ghanaian manufacturing sector.

[27] These sectors are food, textiles, wood and furniture, metal and machinery.

4.2.3 Ghana National Industrial Census 2003

The Ghana National Industrial Census of 2003 was a large-scale government survey conducted in two phases. The first phase collected information on basic data, in addition to location and industrial activity, on all establishments engaged in mining and quarrying, manufacturing, construction and the production and distribution of electricity and water. In essence, the first phase involved the listing of all recognizable industrial establishments in the country. Although the coverage of the census in phase I was to list all recognisable establishments, household industries were not included. These were to be covered under Round 5 of the Ghana Living Standards Survey (GLSS). The enumeration of establishments was also generally restricted to urban areas with the exception of those listed in the interim register that were located in rural areas.[28] Despite the use of carefully designed questionnaires, extensive fieldwork and a nation-wide survey, these industrial censuses have not been carried out consistently over the years. The previous census was done in 1987.

The second phase of the census covered all establishments primarily engaged in mining and quarrying, construction, production and distribution of electricity and water, all manufacturing firms engaging ten or more persons, and a representative sample of manufacturing firms engaging less than ten persons. However, household-based industries were excluded. The data collected included those on wages, employment, assets, production, and ownership, among others. Although a total of 26,493 firms in the various industrial activities were listed to be surveyed, 24,133 were actually surveyed. There is no information on FDI with the exception of ownership characteristics of firms, which provides information on foreign participation in the manufacturing sector.

4.2.4 UNIDO Survey 2005

The UNIDO survey, with its focus on FDI activities, was aimed at understanding the motivations, operational characteristics, and dynamics of different investor groups in the respective countries, in order to be able to forge better promotion strategies responding to investors' needs (UNIDO 2007: i). Despite the focus of the

[28] The interim register of industrial establishments was compiled from existing registers of relevant Ministries, Departments and Agencies (MDAs) of the Government of Ghana, and from business associations in Ghana.

UNIDO survey on FDI activities, we are however persuaded by the fact that the outcome of UNIDO survey provides very little by way of relevant information necessary to realise the objectives of our research. First, it is inadequate because of the relatively small number of observations, 42 overall and 22 in respect of manufacturing.[29] Secondly, there is a high rate of item non-response on questions such as technology, training and research and development expenditures. Thirdly, and related to the previous point, the dataset provides insufficient information with regard to the very pertinent aspects of our research, such as technology transfer, research and development activity, and formal training and skills transfer. Nonetheless, as a comparative dataset, the UNIDO dataset is useful. However, given the scope and emphasis of their survey it was necessary to undertake a survey to obtain information directly that will feed into answering the questions posed in the research.

Despite the availability of these datasets on the Ghanaian manufacturing sector, we came to the conclusion that carrying out fieldwork would be indispensable for this research. Firstly, our survey is intended to fill gaps – discussed in the preceding paragraphs – that are present in existing survey datasets on the Ghanaian manufacturing sector. Further, the interviews with firm managers enabled us to engage directly with FDI recipient firms in order to obtain first-hand information regarding the process by which technology transfer is undertaken. Secondly and related to the first point, we carried out two case-studies. This is because of the limited amount of information that can be obtained from a structured interview, especially so given the objectives of this research. And finally, the existing datasets do not adequately satisfy our needs in relation to the specific objectives and hypotheses of the research. With the exception of the UNIDO survey, these surveys have not been conducted with the primary focus of obtaining information on FDI in the Ghanaian manufacturing sector. But these existing datasets are pertinent because we can use them check and compare our survey findings with non-FDI data for the reliability of our sample results.

[29] The manufacturing category is twenty if we exclude construction from this category.

4.3 Methodological Framework for our Survey

In this section we discuss the methodological approaches employed in previous surveys on the manufacturing sector in Ghana and other African countries with the objective of situating our own research and drawing important lessons to influence and guide the methodological approach in our survey. We have described in the preceding section the three principal datasets on the Ghanaian manufacturing sector. Nevertheless, our discussion will not be restricted to these three surveys, but will include other surveys such as the GEMINI survey and the World Bank Enterprise survey. But before we proceed any further, it is important to state that these surveys were well-funded, organised by public and quasi-public institutions and were invariably large-scale in nature compared to our survey. Nevertheless, we believe our survey was well-conducted and therefore comparable to these surveys in several respects (much of which will be discussed in the empirical chapters).

4.3.1 The GEMINI Survey

In addition to the three surveys described earlier, we include the GEMINI survey. The GEMINI (Growth and Equity through Microenterprise Investments and Institutions) was a six-year applied research project, development, and services project of the Bureau for Private Enterprise, U.S. Agency for International Development from 1989 to 1995. It offered technical assistance, training, economic research, and information to USAID missions and bureaus, implementing organizations, host-country governments, and other organizations involved with microenterprise development (microLINKS 2006). The baseline surveys were carried out in selected countries in Eastern and Southern Africa. These were Botswana, Swaziland, Zimbabwe, Kenya and Malawi. In two other countries, Niger and Lesotho, the baseline surveys conducted were somewhat less comprehensive (Liedholm et al. 1994).

The GEMINI surveys targeted Micro- and Small-Scale Enterprises (MSEs), and counted all activities in the manufacturing, trade and services sectors, regardless of size, location or legal status. However, for firms to be included in the sample, they must market at least 50 percent of their output. But enterprises that were engaged in agriculture or primary product production were excluded. The surveys were country-wide and interviews randomly selected. An MSE was defined as any income-earning

activity employing 1-50 workers including the proprietor. The "micro" category is defined as 1-10 workers and the "small" category, 11-50 workers. Medium- and large-sized companies have more than 50 workers (McPherson and Parker 1993: 2-4; McPherson 1991: 3-5; Liedholm et al. 1994).

Because it was a baseline survey it did not collect information on variables such as profits, sales, costs, capital stocks, or income and data on such matters as policy impact. The basic questionnaire collected information on, among other factors, the type of business activity undertaken, importance of business to family income, location, seasonality of business, employment – by type, number currently employed, number employed at start of business – gender of proprietor, previous business experience of proprietor, and name and address of proprietor. In addition, information was collected on 'closed' enterprises, as well as on start dates and fold-up dates of firms. The identification of a unit of analysis, the enterprise, was via a door-to-door method coupled with on-site interviewing. The shortcoming with this method was the inability to link enterprises from the same household that occur at different sites. For that reason, it was impossible to get a composite picture of the various activities a single household undertakes (McPherson and Parker 1993: 41-49). Another critique is the lack of information on whether enterprises were household-based or not. The advantage with this dataset is that it can be used to analyse dynamic as well as static aspects of the growth of micro- and small-scale enterprises.

4.3.2 The RPED and GMES

The RPED and GMES, as previously stated, began in 1992 and since then there have been 7 waves, covering the period 1991 - 2002. As such it represents one of, if not the only comprehensive dataset on Ghana's manufacturing sector. It is however an unbalanced panel as some of the initial 200 firms dropped out of the survey for various reasons. Furthermore, the structure of the questionnaire and the range of questions included have varied over the 7 waves of the survey, to take account of experience from the field and in response to emerging research issues. All the surveys involved the collection of both firm-level information and detailed information on a sample of workers in the firm (Teal 1998, 2002). And although it represents a rich source of information for the analysis of the performance and structure of the manufacturing

sector in Ghana, it lacks the depth of resources needed to analyse the impact of FDI activity on the manufacturing sector.

The selection of the initial sample of 200 firms was randomly done using the list of firms from the 1987 Census of Manufacturing Activities in Ghana. Though randomly selected, the sample was chosen to ensure that selected firms were largely representative of the size distribution of firms across the major sectors of Ghana's manufacturing industry. Four size categories were used: micro (less than five employees), small (5–29 employees), medium (30–99 employees), and large (100 or more employees). The choice was also influenced by location; sampled firms were situated in the major urban centres in Ghana. These are Accra, Kumasi, Takoradi and Cape Coast. Information on both the firm and sampled workers were collected in face-to-face interviews (Teal 2002).

The main questionnaire covers the following aspects of the firm: general background information on location and type of activities, the background of the owner of the firm including reasons for setting up the firm, a brief history of the firm, and training provided to the owner. It also includes general aspects of firm operations, such as record keeping, production, costs, revenues, and exporting. Other areas covered include, investment decisions, employment and labour issues, the effect of government regulations, financial markets, and infrastructure on firms, investor confidence, networking by firms and conflict resolution issues.

4.3.3 The World Bank Enterprise Survey 2007

This is also a firm-level survey of a representative sample of the private sector and commenced in 2002. The current survey on Ghana was conducted in 2007 with data gathered for the year 2006. Thus by its focus on the private sector it excludes state-owned firms. However, it is unclear if state and private sector joint ventures are also excluded. The number of interviews conducted varies with the size of the economy. In larger economies, 1200 – 1800 interviews are conducted; whilst in medium-sized and small-sized economies, 360 and 150 interviews are conducted respectively. Firms in the manufacturing and services sectors are the primary focus of these surveys. Hence, the questionnaires were structured to account for differences in the nature of manufacturing and services activities. Firms were selected using stratified random sampling with

replacement. The strata for selection were size, sector and geographic region in country. In many respects this stratification process is similar to that used in RPED and GMES with the exception that the sectors in the RPED and GMES were all within manufacturing. On size, firms were categorised in the World Bank survey as follows: small (5–19 employees), medium (20–99 employees), and large (100 or more employees). However, according to the World Bank (2008) the data from the World Bank Enterprise surveys are not comparable with the RPED and GMES, which was also initially started with support from the World Bank. Apparently, the survey methodology and survey questionnaires have changed substantially.

The surveys cover a range of issues on the business environment. Indeed, a greater number of questions are on a country's business environment. These include, access to finance, corruption, infrastructure, crime, competition and performance measures. In addition, there are also questions on gender participation, workforce composition, innovation and technology. Though carried out in many countries, each survey has country specific questions. The questions on technology had dichotomous responses (yes/no), and related to use of technology licenced from a foreign-owned company and whether a firm had any patents registered overseas or domestically (World Bank 2010a, b, & c).[30]

4.3.4 UNIDO African Investor Survey 2005

The objective of the UNIDO survey was to assess the operations and perceptions of investors and track changes over time. Thus, it attempts to document trends in investment inflows to SSA, pattern of investor motivation and origins. The first survey was conducted in 2001 on a pilot basis, with the second in 2003. The 2003 survey was in ten countries and the third in 2005 in fifteen countries. The survey was limited to FDI firms in each country, but excluded firms in the mineral extraction and oil sector. Consequently, the survey was concentrated on manufacturing, construction and services. However, micro level manufacturing and services companies were excluded. Information on these firms in each country was based on data collected from the national Investment Promotion Agency, government business registration offices, foreign and local chamber of commerce, business associations and embassies.

[30] The discussion on the World Bank Enterprise Survey has been drawn largely from the Enterprise Survey Methodology from the website www.enterprisesurveys.org

The questionnaire was separated into seven sections. These were general information regarding the firm and the type of business activity, origin of investor, profile of local partner if a joint venture, exporting activity, employment, impact on the host economy, and investment and operating experience in the host country. The questionnaires were made available to respondents in both hard and soft copy, although most preferred the hard copy version. UNIDO relied on their country and regional offices to administer the survey. Additionally, two or more consultants were employed to manage the survey in each country. The method of questionnaire administration was first, to call the firms, arrange a meeting with the chief executive officers, visit to provide the briefing and then leave the questionnaire for pick up later.

In the survey, exporting activity was captured if a firm exported at least 10 percent of its output. Further, technology and R&D, and the training of workers were captured by the amount expended by firms on these activities. There were also questions on relations between FDI and local firms, especially on sub-contracting and the use of locally produced inputs.

4.3.5 Ghana National Industrial Census 2003

The Ghana National Industrial Census 2003 was conducted on the major economic activities in the entire industrial sector. These activities are mining and quarrying, construction, production and distribution of electricity and water, and manufacturing. Our emphasis here is on manufacturing. The census on manufacturing activity was restricted to all firms employing at least ten workers. By definition, micro enterprises were excluded and so too were household-based firms.

In addition to gathering general information about the establishment and its principal manufacturing activity, the focus of the questionnaire was to obtain data on employment and earnings, the levels and value of stocks of input, work in progress and output, the value of, and changes in fixed capital formation (defined as land, buildings, machinery and transport equipment) during the financial year, sales and other receipts during the financial year, and the level of industrial capacity utilisation. However, there is no information on exporting activity, technology and innovation by firms and neither is there any information on FDI within the manufacturing sector except if inferred from the nationality of ownership, which hardly provides any indication of FDI. Nonetheless,

the advantage with the information available from the census is that it serves as a basis for comparing the outcome of other surveys with the national estimates. It also serves as a starting pointing for constructing a target population for a specific survey.

To summarise, we note that the questionnaires from the surveys discussed have proved useful templates from which to design our survey methods. Thus, in areas such as general firm information on location, goods produced, year of establishment, and management structure, we utilise where possible templates of questions and approaches to ensure a degree of comparison between our findings and those of previous surveys. However, in certain aspects, such as our selection of firms for the survey, size and location were not a factor. Nevertheless in Chapter 5 there is a discussion of the size and location characteristics of FDI firms. What we however observe is that FDI firms operated in many sectors of the manufacturing sector, and invariably self-select into the various sectors they found themselves. In the next section we discuss in much detail the development of the survey method. In conclusion, it is worth emphasising that despite not stratifying our sample selection by sectors and size, this would not bias our survey outcomes. In our sampling method, the intent was to obtain a sample that was fairly representative of the FDI firms, which by definition are an important subsector of the entire manufacturing sector.

4.4 The Fieldwork and Survey

4.4.1 The Fieldwork

The discussion in the preceding section reveals the gaps and missing data present in the existing datasets on FDI in the manufacturing sector in Ghana. The essence of the fieldwork was therefore to obtain first-hand, as opposed to second-hand, information on the characteristics and activities of a sample of FDI manufacturing firms in Ghana. The intent was to gather an extensive set of quantitative and qualitative data which would generate better understanding of the activities of FDI in the manufacturing sector. The fieldwork was carried out in Ghana from August to December 2009. Initial preparatory work had begun in London by engaging with previous survey reports on Ghana's manufacturing sector, books and manuals on survey methodology, government policy documents, and making contacts with persons and institutions in Ghana who might be helpful in the conduct of the survey. In Ghana,

my main base of operations was in Accra, the capital, from where almost every aspect the political and economic life of the country is decided. However the fieldwork took me to five of the ten regions, although Accra always served as the base to which I would return after journeys to other regions.

As part of my preparatory work, I made my first visit to the University of Ghana to apply for research affiliation with the Department of Economics and the Institute of Statistical, Social and Economic Research (ISSER). Eventually, affiliation with the Department of Economics was sufficient to enable me carry out my initial enquiries with government departments and agencies as well as industry organisations. This affiliation was also necessary for the effective conduct of the survey of manufacturing firms. As a result I was provided with an introductory letter spelling out that I was a PhD student conducting research in Ghana, the objectives of my research and requesting cooperation from all agencies and firms I intended to visit.

Subsequently, interviews and discussions about my research objectives were held with the research officers at the Association of Ghana Industries (AGI), the Ghana Statistical Service (GSS), the Ghana Investment Promotion Centre (GIPC) and the Ghana Free Zones Board (GFZB). These institutions were first contacted because their activities involve dealing directly with manufacturing firms and/or registering, providing advocacy for, and assisting manufacturing firms. The research officers at the manufacturing section of the GSS provided a list of manufacturing firms that was created as a result of the 2003 Industrial census, the census questionnaire, various reports on the census and other reports on manufacturing activities in Ghana. In the case of the GIPC and GFZB, their activities centre on promoting and assisting the establishment of foreign direct investment in Ghana. Thus a list of registered FDI firms was procured from the GIPC and GFZB. Additionally, their research officers provided useful leads on persons to contact in a number of firms, information that proved invaluable when it came to arranging and carrying out interviews with firm managers.

Furthermore, the research officers at AGI also provided advance warnings of the potential problems to be encountered when approaching firms for interviews, particularly the difficulty of getting past gatekeepers and the reluctance to cooperate in completing the questionnaire. But they provided useful suggestions, including adjusting the questions that sought to ask firms directly about the value of their sales and output into ranges for sales instead. In that case, firms would not feel they were divulging too

much information. They also provided an up-to-date list of their members and the names and contacts of senior managers in a few firms. These senior managers were those that participated actively in the AGI's survey on the business environment in Ghana and were therefore more likely to cooperate in this survey.

In addition to conversations and interviews with research officers in the various government and industry organisations, I made visits to libraries to acquaint myself with existing publications and reports on the manufacturing sector in general and FDI in particular. There were also visits made to the Business School at the University of Ghana and the Ghana Institute of Management and Public Administration (GIMPA). These two educational centres were visited because they offered bespoke training programmes and short courses for businesses in Ghana. The relevance of the visits to these centres was to obtain information and data on firms that subscribed to training, requested bespoke training and the type of training programmes provided. Although these pieces of information, especially about which types of firms were their clients, were not relevant in constructing a population frame, they were very important in shaping the aspects of the questionnaire that dealt with training and in providing a range of issues related to training and management within firms to discuss during interviews.

Considering the scale of the research survey, the services of two research assistants were procured. The two were postgraduate students at the Department of Economics, University of Ghana, who were working as graduate assistants at the Department. Their tasks included help with updating the list of firms from other registers, follow-up phone calls to arrange meetings with senior managers, make photocopies of questionnaires and other relevant documents, purchase of documents from state institutions, and assisting with other administrative issues that came up during the course of the fieldwork. The two were selected after consulting with the Head of Department and interviewing four potential candidates for this task. At the end of the process two were selected because of cost considerations and also because of their reliability, commitment to work and the understanding they brought to the task at hand. These two had also been part of research activities including surveys undertaken by staff at the Department of Economics and ISSER, and therefore had significant experience to assist with our survey.

4.4.2 Positionality in the Field

An important aspect of fieldwork, especially in the traditions of cultural anthropology, social and economic geography, sociology, and feminist scholars, is the issue of researcher, positionality (Abu-Lughod 1988; Sultana 2007; Hopkins 2007; Jackson 1993; Smith 1993; Visser 2000). The positionality of the researcher is important because it has implications on the research process, (Desmond 2004; Visser 2000). Where the researcher fits vis-à-vis the researched could influence whether an objective value-free research is conducted and thus have implications on any findings obtained.

In conducting research in the field, the researcher could be researching down, where the researcher is of a higher social standing than the researched, researching up, the converse of researching down, or involved in researching contemporaries. Although it is usually the case for a researcher studying down, as tends to be the case when western scholars conduct research in developing countries, the same cannot always be said of the 'indigenous' researcher. Additionally, indigenous researchers can find themselves in the dichotomy of the insider or the outsider. However, this apparent boundary that exists between the insider and outsider in ethnographic research, social anthropology and cultural geography is arguably blurred and in reality constitute a process of shifting boundaries between insider/outsider, (Desmond 2004; Sherif 2001; Visser 2000; Narayan 1993). Thus the researcher finds him/herself in various states simultaneously. That is, as an insider, outsider, both, in-between-ness and neither, (Sultana 2007; Mullings 1999; Nast 1994; Gilbert 1994). But the concern really is about the potential errors and biases that may result due to where the researcher is situated within this insider–outsider spectrum.

But in the case of our fieldwork in Ghana, we were confronted with the challenge of researching up and the consequent unequal power relations between the researcher and the researched. In both the preparatory work before the actual survey and the conduct of the survey, we had to interview individuals who can be categorised as "elites"; research officers and managers in government and quasi-government institutions, and senior managers in firms. As Desmond (2004) notes, such individuals derive their elite status by virtue of their control of human, capital, decision making and knowledge resources. And in this category, business managers and firm owners fit neatly.

As a Ghanaian from a university in the United Kingdom, I could neither classify myself as an insider or an outsider by the strictest of interpretations; in many respects I could describe myself as an "insider-outsider". Other writers, (Abu-Lughod 1988: 143; Sherif 2001) use the term "partial insider". This is a researcher with background ties to the cultures being studied and thus with a certain insight into the dynamics that can occur in the research process. With such a status I know where to go and whom to see. However, it did not necessarily provide guaranteed exclusive access to any information I needed. But the picture is slightly mixed. In the conduct of the preparatory work, it was relatively easier than an outsider to use the network of friends and former colleagues to access information and materials from public institutions. Consequently, the task of arranging interviews with research officers and managers within these institutions became less arduous. Many of these individuals were very helpful as they usually encouraged me and provided useful guides and hints about how to carry out my survey successfully.

However in carrying out the survey, many of the respondents viewed me as someone who was "desperate for information" in order to satisfy my own objective, that is, complete my research and studies. From their perspective, I was at their mercy; they could decide what and when I could interview them, whether they will participate in the survey at all, and what kind of information they thought I needed. This attitude initially hindered my ability to arrange for interviews with senior managers. Being Ghanaian did not offer any special privileges, if anything it was an obstacle. I became convinced that if I had been an outsider, the situation would have been different. It is not unknown that greater access to officials and information is usually provided to outsiders (Western researchers) than insiders (local researchers). But I stress here that this is not necessarily a generalised point. Another complication in my case was that I was based in the U.K. There was the perception that I had come with a lot of money – "pounds sterling to melt" – and was therefore expected to pay my way through.

To overcome this problem I had to become an insider. Hence there was no mention of being a research student at the University of London, and therefore I had to introduce myself as a local researcher. I began to rely heavily on local networks and recommendations from other senior managers, friends, industry association members and the research officers I had previously interviewed. It worked very well, though not all the time. But, once I had the name of a senior manager in a firm within the sample, making contact was easy and quick. At the first meeting, I quickly introduced myself,

stated who had recommended me to meet them and described the nature of my research to them. We then arranged to have an interview at an agreed date, usually within a couple of days. Indeed, it was through these encounters that I managed to arrange for further detailed conversations and discussions for my case studies. Although these experiences were highly educational, it was also a very difficult experience for me.

4.4.3 Questionnaire Development and Pre-Survey Testing

The questionnaire represents the predominant means of data collection in survey research. In spite of its widespread use in surveys, the use of questionnaires is not without its limitations. Gillman (2000: 5-14) for example provides a good assessment of the arguments for and against the use of questionnaires, which are developed below. During the initial couple of weeks after my arrival in Accra, work on finalising the questionnaire was undertaken. Although preliminary work on drafting and finalising the questionnaire had been done in London prior to the visit to Ghana, it was necessary to make adjustments that had become imperative as a result of new information from observations made in the field and comments from research officers from the AGI who had been consulted. These adjustments to the questionnaire were done in consultation with my supervisor, who also provided very useful inputs in shaping the final questionnaire.

The development of the questionnaire itself was guided by existing questionnaire templates from previous surveys on Ghana. The purpose of using these existing questionnaires as a guide was to provide direction on the standardised methods for collecting basic firm level information and very importantly to ensure consistency and comparison with other survey data. In addition, it provided focus to our research to avoid duplication and to concentrate on issues that are specific to the objectives of the research. Hence the focus was to ask questions aimed at eliciting critical information on the issues under investigation. Where space permitted a couple of other questions with a tangential bearing on the issues under investigation were included. The final version of the questionnaire used for the survey is reproduced in Appendix A.2.

One of the major setbacks of firm level surveys is the problem of non-response arising from non-cooperation by firm managers. Non-cooperation by firm managers (respondents) may stem from perceptions such as: futility of the survey outcomes,

irrelevance to their organisational (here firms) goals, and time-wasting on their part. With this in mind, the questionnaire was designed so that this problem could be overcome or minimised. Thus, immediately after the first section, which requested general factual information about firms, we placed questions and issues that were more likely to excite the interest of managers and therefore elicit their response and comments in the subsequent section. These questions were phrased in a straightforward manner, with Likert-scale responses, and touched on constraints on firm operations and performance as well as their views on the economy as a whole. An open-ended question was also available to enable firm managers to express whatever views they thought worth expressing regarding the impact on their operations of the economic environment. No inhibitions were placed on managers on what issues they could talk about. The objectives were to ensure that they could talk and complain about issues they felt strongly about. This was also to ensure a good rapport was established, and therefore make respondents feel comfortable answering questions that are sensitive and regarded as intrusive.

Another aspect of non-response is item non-response. This occurs when the respondent does not provide complete responses to all questions on the questionnaire. In some cases the respondents do not know the answers to the questions or may simply refuse to provide answers because they believe such questions are sensitive, unnecessary or disconcerting. To minimise item non-response, we decided that for closed-ended questions that had specified responses such as Yes/No, a Don't Know option was included to reduce the probability of respondents deliberately not answering such questions in the fear that providing a 'Yes' or 'No' answer might provide guarded information either way to the interviewer.

Additionally to simplify the response task for interviewees and minimise any loss of interest that might occur during the course of an interview schedule, only relevant questions were asked in the questionnaire. We also ensured a fair mix of closed-ended and open-ended questions to ensure ease of response to questions and reduce possible disinterest by respondents. As part of this approach, responses to closed-ended questions, had selected responses, such as, Yes/No/Don't know, ticking an appropriate answer, or Likert-scale responses. Open-ended questions also had specified responses, such as, providing the number of persons employed or the percentage of sales exported. Although the approach of asking simple closed-ended questions was aimed at minimising any loss of interest by respondents, it also had the

advantage of ensuring ease of recording and completing questionnaires during interviews.

To minimise low response rates, we decided to opt for the interview-schedule instead of mailing the questionnaires out. It has been recognised that one of the factors responsible for low response rates, especially in firm surveys, is the mailing out questionnaires to respondents for them to self-administer and post back to the researcher. Mailed questionnaires have the advantage of saving time and costs, especially travel costs. It can also reach a wider coverage where the postal system is efficient and covers every town and household in a country. On the downside, respondents, often if they receive questionnaires, will either leave it till later to complete (eventually forgetting about it), or hand it over to some other staff member to complete, hence not being done well. Thus, considering the likelihood of a very low response rate, we opted for the interview-schedule approach. In this approach, the researcher (enumerator) simply reads out the questions as already framed and records responses provided by the respondent. In this regard, we first approached selected firms, introduced ourselves, stated the objectives of the research, arranged for a suitable time to have the interview and left a copy of the questionnaire with the relevant manager (in most cases the public relations/human resources manager) for their perusal. The idea of providing in advance a copy of the questionnaire was to allow the relevant managers the time to have a look at the questions and prepare adequately for the interview.

The advantage of using the interview-schedule is that we were able to strike a rapport with respondents, winning over their confidence and providing a personal touch to any assurances regarding the objectives of the questionnaire and the responsible use of information obtained. Further, questions are clearly asked and explained, when necessary, and it was easier to obtain clarifications and follow-ups to responses that were unclear. This method also aided in the quick completion of questionnaires. It therefore ensured higher response rates to questions and the questionnaires in general than would be the case if they were mailed. There are however drawbacks with this approach. The anonymity of respondents is compromised, it is time-consuming, and involves a great deal of negotiations with and convincing of respondents. Patience and perseverance is of great importance as is money since it is an expensive way to collect information.

4.4.4 The Pre-Testing Survey

The pre-testing of the survey questionnaire was carried out on six firms, with adequate responses from four firms. The main objectives of the pre-testing of the questionnaire was to estimate the length of time needed to complete them, the ease with which respondents understood and correctly answered questions, and whether there were problems with the structure of questions. Based on the comments and answers provided, a few changes were made. To allow for a more interviewee-friendly questionnaire, the layout of almost all the questions was in a grid form. Further, the order of questions was altered to ensure that, whilst the interest of respondents was gained and sustained, the very important questions for the research were brought forward ahead of tangential issues in relation to the research. Hence, the section on *Assessing the Impact of FDI within Firms* was placed immediately after the section on *Impact of General Economic Conditions on Firms*. This was followed by sections on the *Employment, Operations, and Management* profiles of firms. Thus, questions on the *Management Profile of Firms*, which were initially placed after the section on *General Profile of Establishment*, were placed at the end of the questionnaire. Finally, the recall period was reduced from five to three years for Questions 23 and 26 and for two years for Questions 20 and 21 because of the problems associated with recall, especially where proper records are either not kept or not readily available.

Within the section on *Assessing the Impact of FDI within Firms*, Q.17 was expanded to incorporate questions on formal training provided by firms, the existence of a mentoring scheme for staff, and the provision of informal training arrangements within firms. Further, for responses to the questions on Research and Development (R&D) activity and training we opted for Yes/No/Don't know responses instead of asking for actual expenditures by firms. This approach was chosen because of non-response by firms and that in the UNIDO and CSAE surveys the responses provided to questions on expenditure by firms on R&D and training were not just very low and unrealistic but the response rate on them was also low.

We observed during the pre-testing that there was general unease on the part of senior managers regarding questions on output, sales, profits and in some cases employment. They wondered what the basis of such questions was, and suggested that they were too intrusive. They were also not convinced by any assurances of anonymity and confidentiality. But these difficult questions needed to be asked and without any

access to firm archival information, there was no choice but to press for answers. However, upon advice from research officers from the AGI and a couple of senior managers interviewed, questions on output and profits were omitted. The question on sales of firms was far easier for them to respond to than these other two. To allay the sensitivities and anxieties of respondents, the question on total sales was placed into six categories to allow for ease in responses. The categories are in US$ because in 2007 the local currency, the Cedi, was redenominated such that 10,000 Cedis became 1 Ghana Cedi. At about the same period, the exchange rate between the Cedi and US$ was 10,000 Cedis to the Dollar, which implied 1 Ghana Cedi was equivalent to 1 US$. The choice of the US$ was for convenience and practical purposes.

4.4.5 The Case Studies

In order to complement information obtained from interviews and to enrich our research, we carried out case studies on two FDI firms that were more amenable to the research and therefore willing to provide further information on their activities.[31] The purpose of these case studies was to provide us with additional information on technology transfer activities, training and exporting activities by FDI firms, albeit it from the view point of only two firms. The information obtained is used to augment our discussions in the empirical chapters.

Although our empirical findings are based on data obtained from the use of questionnaires during fieldwork, the questionnaire has its limitations. Gillman (2000: 81) for instance, argues that the results from a questionnaire tend to have a thin, abstract quality, and with a complex research question the data from a questionnaire could be superficial. What the questionnaire provides is therefore a snapshot of the activities of the firm. Information obtained may also be out of context by the time it is gathered. Because it is a snapshot, we can't go very far back and neither can we anticipate future changes in the firm's performance and operations. For example, in our survey the recall period was three years, whilst the year for which information is gathered was 2008, despite the survey taking place in 2009.

[31] Our initial objective was to select four FDI firms for the case studies. However, it turned out that only two firms were willing to participate.

Thus, in the absence of and without access to archival data from firms, the use of case studies – whereby we probe further issues relating to training and technology transfer – represented a good alternative. The case study is not entirely without its own biases. Firms that are willing to participate may be motivated by a desire to put across their perspectives on issues raised in the survey. Although the use of case studies may allow for extensive interviews, the problems of limited recall by interviewees and the limitation of time are not entirely overcome. For instance, changes in the management of firms, poor record keeping, and the need to obtain accurate information implies the recall period will still be limited to a few years. Senior managers also have limited time on their hands to sit through long conversations, and are also less willing to open up their enterprises' activities to an 'outsider'. In spite of these challenges in conducting case studies, we found the process greatly enriching and useful in our understanding of certain aspects – training and exporting behaviour – of FDI firms.

In carrying out these case studies, prior approval was obtained from the relevant section managers within the two firms. The choice of the two firms, Promasidor Ghana Limited and Blue Skies Ghana Limited, was based entirely on the willingness of senior managers to be interviewed extensively. These interviews were however secured after a series of negations with senior managers of the firm and therefore represent the views of these managers. These negotiations began after the questionnaires had been administered, and the managers had showed a willingness to participate in subsequent conversations regarding certain aspects of their firms' operations. Despite showing the willingness to provide extra information on their activities, the senior managers raised a few issues concerning confidentiality, especially some information sought in respect of sales, profits and employment.

We have to also point out that it was not possible to undertake these extensive interviews with a standard survey instrument. The senior managers were only willing to talk about the activities of their firm, which they felt comfortable about, and this limited the ability to compare these firms directly. Again these firms are not representative of FDI manufacturing firms and no attempt was made to choose them on an objective criterion. The only criterion was the willingness of the senior managers to talk about specific activities of their firms. It is worth emphasising that in the exercise of administering the survey and securing subsequent interviews for case studies, several firms declined to participate.

4.4.6 The Survey

In terms of going about the task of conducting interviews with firms, the sample survey was adopted. The sample survey is a flexible approach adaptable for the various requirements of data collection, and in addition allows for inferences to be made about a population. Some authors (De Vaus 2002; Fowler 1993; Weisberg and Bowen 1977) have variously described a survey to consist of a structured approach to data collection and analysis with a goal to develop statistics about a population. Thus, a sample survey therefore brings together three essential methodological elements: sampling, question design, and interviewing, (Fowler Jr. 1993: 4). The important feature of a survey is therefore the systematic collection of data (and/or facts)[32] that allows for the systematic comparison between observed units with the same characteristics.

Surveys also have the advantage of being flexible in terms of the size of the research area and sample number. Additionally if a survey is less intensive in nature, it could be less costly in terms of time and money, (Scott 1991). Casley and Lury (1984: 49) list other advantages aside economy, to include adaptability and accuracy.[33] Considering the circumstances of the fieldwork in Ghana – limited resources and time, and the non-existence of a comprehensive list of FDI manufacturing firms – a census would be neither possible nor desirable. A survey was the best and only option available to us. The survey undertaken during fieldwork can best be described as an "Ad Hoc Survey", which Casley and Lury (1984: 54), describe as one typically undertaken by private researchers and official data collecting agencies, and is carried out to meet specific objectives within a certain time frame.

Prior to the survey, the expectation was that the sample of firms would be sufficiently representative. Hence the intention was to survey firms throughout the country. Eventually, however, we managed to carry out the survey in five out of the ten administrative regions in Ghana (see Appendix Figure A.1 for a map of Ghana showing the ten administrative regions and their capitals). These were the Greater Accra, Central, Western, Eastern, and Ashanti regions. However we managed to interview a firm which had its plant located in the Northern region but the head office in Accra. The highest concentration of firms was in the Greater Accra region, where the capital is also

[32] Social surveys are described as a systematic collection of facts in the book *A Short Guide to Social Survey Methods*.
[33] Because the quality of enumeration and supervision can be higher than in a census, the quality of data collected should be better.

situated, followed by the Ashanti region and Western in that order. Consequently, a greater percentage of the fieldwork was carried out in these three regions, with relatively short stay visits to the other regions. The short stays were largely due to the relatively small number of firms in these other regions that could be surveyed. Almost all the firms were located in the most urbanised localities making travel and communication easy.

4.4.7 The Population Frame

The task of compiling a population frame for firms from which a sample can be drawn is usually challenging in many developing countries, such as Ghana. These challenges emanate from a number of factors, such as, the absence of a complete register of firms (with weak updating mechanisms by state institutions), poor record keeping by official government departments, and cumbersome registration processes forcing some firms to avoid any registration whatsoever. Closely related to this last point is the case of firms that operate in the informal sector. Firms in this sector are generally non-existent as far as official registers are concerned.

These weaknesses nonetheless, there exists different lists for firms complied by various state institutions for different purposes. For the manufacturing sector, these state institutions are the Ghana Statistical Service, the National Board for Small-Scale Industries, the Ghana Investment Promotion Centre, and the Ghana Free Zones Board. In addition, there are industry associations that keep a list of members. The most important for our purposes is the Association of Ghana Industries.

These official lists thus serve as the useful starting points when we need to define the population. But we acknowledge that they too are incomplete and in some cases may be limited to firms above a particular size threshold. Consequently, small sized firms are usually under-represented in such lists. Secondly, some firms, such as those operating in/from households or employing household non-waged labour tend to be excluded, and therefore less likely to be represented in a survey relying on official lists.

What, however, constitutes the population frame is the vital starting point for all surveys. Hansen et al. (1993: 1-3) defines the population frame as any well-defined set or class containing a finite number of elements. These elements could be plants, farms, persons, businesses, and so on. The population will therefore consist of certain of these elements, for instance, farms of over a specified size, unemployed persons in a country, or the businesses in a particular province. However, any population is guided by the objectives of the research for which the sample is required. In that respect, in defining the population, it is important to state the kind of elements of which it consists and to give rules for including or excluding any particular element.

4.4.7.1 The Target Population

The target population refers to the ideal population required to meet the survey objectives or to whom the survey's findings are to be applied, (Kalton 1983: 6; Fink 2003: 2). In other words it is the population to be studied, or as (Biemer and Christ 2008: 318-19) describe it, the inferential population. In this research, the target population consists of all FDI manufacturing firms in Ghana. Although these firms can be broadly described as homogenous in terms of being recipients of/having been set up as a result of FDI, the same cannot be said of their sizes, products and the sources of FDI. Practically we are unable to rely on a single and complete list of all firms that satisfy this criterion, especially because as previously stated official lists are not always up-to-date whilst some firms may not bother to even register with these agencies. Different agencies also keep different lists to satisfy their idiosyncratic objectives. The first task is thus to assemble a comprehensive list of FDI manufacturing firms drawing upon the fragmented lists from various state and quasi-state agencies. This approach of actually identifying and compiling a list of firms that have been set up from and/or associated with FDI activity is distinct from that of many previous studies on Ghana, [34] whereby the mere presence of any element of foreign ownership is broadly defined as FDI.

To construct the target population we rely on four official lists (with the names and physical locations of establishments). The official state institutions from which the lists were obtained are the Ghana Statistical Service, Association of Ghana Industries (a

[34] Examples include, (Waldkirch and Ofosu 2010; Harvey and Abor 2009; Abor et al. 2008)

voluntary and advocacy business association of over 1200 members, consisting of small, medium and large scale manufacturing and services industries),[35] the Ghana Investment Promotion Centre (a state institution mandated to facilitate and encourage investments – more specifically foreign direct investment – in sectors of the economy except mining and petroleum),[36] and the Ghana Free Zones Board (a state institution that provides the framework by which firms can take advantage of free zones and export processing zones to export a minimum percentage of their output). The Ghana Investment Promotion Centre and the Ghana Free Zones Board deal directly with FDI related activities and therefore represent the first building block in constructing the target population. To these we added firms with foreign ownership that were on the lists from the Ghana Statistical Service and Association of Ghana Industries.

The number of manufacturing firms on the list provided by the Ghana Free Zones Board was 202 as of 2008, whilst the number on the Ghana Investment Promotion Centre was 125 as of 2008. But firms on the two lists are also registered with the Association of Ghana Industries, whilst a sizable proportion was also on the Ghana Statistical Service's list. Hence, there was an overlap of firms on all four lists. Consequently, there was the need to clean the amalgamated lists and consolidate that into one list for all FDI manufacturing firms in Ghana.

After the tedious and long process of updating and cleaning, we obtained a list of 414 firms that are associated with FDI activity within the manufacturing sector. However, further checks on addresses via telephone contacts revealed that 32 firms could not be reached, suggesting that they may have folded up or relocated or were non-existent for whatever reasons. Eventually there were 382 firms representing the target population. In spite of this, we could not envisage surveying all of them for practical and financial reasons. As Biemer and Christ (*ibid*: 319) argue, although the target population is regarded as the ideal population to be studied, it can rarely be achieved in practice. Hence a proportion of the target population (the sample) is selected to be studied. We next turn to explaining how the sample for the survey was selected.

[35] The industries in which firms are located include agro-processing (food and beverages), agri-business, pharmaceuticals, electronics and electrical, telecommunications, information technology, utilities, service industries, transport, construction, textiles, garments and leather, banking and advertising.
[36] The most prominent of these sectors are manufacturing and services.

4.4.7.2 The Sample Population

The sample population is representative of the target population, which we define to include all FDI manufacturing firms in Ghana. A very important element of the survey method is that generalisations about the larger target population can be made from the sample population. Nonetheless, the accuracy with which a sample can represent a population depends on three important pillars: the sample population, the sample size, and the specific design of selection procedures, (Fowler Jr. 1993: 10). These essential characteristics of the data obtained as well as sampling procedure are intended to remove or eliminate bias. Therefore, a very important characteristic of good sampling approach is that it gives every member of the population the same or known chance of being sampled, technically termed *Probability Sampling*. The selection of the sample population is drawn from a list of the target population. The members on the target population must be numbered or otherwise identified; in other words, there must be a unique identification system each member. From this list it is possible to select a sample of elements from the target population with known probabilities. Probability sampling has the advantage of providing a measure of precision, that is, to provide objective numerical statements concerning the precision of survey results, (Hansen et al. 1993: 6-7).

The target population consisted of a list of 382 firms distributed, albeit unevenly, across the country. The list is randomly ordered and does not exhibit any variability with respect to the survey variables. Approximately 76 percent of firms were located in the Greater Accra region where the capital of Ghana is located, with the remainder spread across the other nine regions. Three regions, the Northern, Upper East and Upper West had very little representation, approximately 1.3 percent in total. These three regions are also among the poorest in Ghana. The regional distribution of FDI firms is presented in Table 4.2.

Table 4.2: Distribution of FDI Manufacturing Firms by Region in Ghana, 2008

Regions	Total FDI Firms	Percentage Distribution of Firms
Western	19	4.97
Central	11	2.88
Greater Accra	290	75.92
Volta	6	1.57
Eastern	15	3.93
Ashanti	31	8.12
Brong Ahafo	5	1.31
Northern	3	0.79
Upper East	1	0.26
Upper West	1	0.26
Total	**382**	**100**

Source: Author's compilation using information from GIPC, GFZB, GSS and AGI

However, due to budget, logistics and time constraints, we decided to conduct our survey in the regions where the majority of all firms were located. These were Greater Accra, Ashanti, Western, Eastern and Central, where approximately 96 percent of firms were located. Table 4.3 depicts the distribution of FDI firms in these five regions. In total there were 360 firms in these five regions. Here too we observe the predominance of firms in the Greater Accra region relative to the other four regions. The proportion of firms in the Greater Accra region is even higher, nearly 79 percent.

Table 4.3: Distribution of FDI Manufacturing Firms for Regions in Ghana, 2008

Regions	Total FDI Firms	Percentage Distribution of Firms
Western	19	5.28
Central	11	3.06
Greater Accra	284	78.89
Eastern	15	4.17
Ashanti	31	8.61
Total	**360***	**100**

Source: Author's compilation using information from GIPC, GFZB, GSS and AGI
*Note: The actual number of firms on the final list was 366. Six firms were used for the pre-testing of the questionnaire and therefore excluded. These firms were all selected from the Greater Accra region.

Ideally we would have been pleased with a survey of all the 360 FDI firms. But as indicated in the preceding paragraph, budget and time constraints meant this was practically impossible and an unrealistic prospect, especially given the fact that we had opted for the interview-schedule method. The alternative was to mail the questionnaires to the firms for them to self-complete and mail back. But this method generally

produces very low response rates due to several factors. These factors include an unreliable postal system and postal addresses, inability of firms to respond, and the loss of completed questionnaires in the post. Thus, the inability to survey all 360 FDI firms or opt for a postal survey, meant sampling a proportion of these firms represented the most convenient and practical approach for achieving the research objectives.

The basis of most probability sampling methods is simple random sampling. This method is simple to implement and provides every element of the population with an equal probability of selection. Despite the benefits and simplicity of simple random sampling, we argue that reliance on this method is most likely to result in a higher than acceptable proportion of firms from Greater Accra in the survey sample. Indeed, we envisaged a situation whereby the entire sample might consist of firms located in the Greater Accra region because of the extremely high probabilities of selection of such firms.

Thus, to avoid this scenario and ensure that a representative sample is obtained, the stratified random sampling approach was used. In this approach, the population of *N* elements is classified into non-overlapping subpopulations (administrative regions) called strata and a sample is taken from each stratum using simple random sampling. Although the population is stratified, there is no desire to undertake any statistical analysis of each stratum. The advantage in using stratified random sampling is that the variability of estimators for the whole population can be smaller than with other sampling methods, (Jolliffe 1986: 41). The list of 360 firms was therefore stratified according to administrative regions. However, firm size, origin of FDI and 3-digit ISIC[37] product classification of manufacturing activity were not factored into the stratification process because prior information on these characteristics of FDI manufacturing firms were not available. The main purpose for stratification by location was to ensure that FDI manufacturing firms located in the other regions could be sampled.

A very important aspect of surveys, which also has implications on the results obtained, is the sample size. The size of the sample is determined partly by the expected variability in the data to be collected and partly by the size of error acceptable to the researcher, (Jolliffe 1986: 13-14). A larger sample size results in greater precision and reliability of sample estimates, and a smaller sampling error. But with

[37] ISIC is the acronym for the International Standard Industrial Classification for all economic activities.

larger samples the costs also rise and there is a limit (in terms of cost and time) of what can be afforded (Barnett 1991: 31-32; Fink 2003: 34-35). Further, the improvement to sampling error as a result of increase in the sample size is minimal. Weisberg and Bowen (1977: 37) for example argue that quadrupling the sample size only cuts the error rate in half. The choice of an appropriate sample size thus involves a complex array of considerations. The World Bank (2009: 5) note on sampling methodology for the enterprise survey provides guidance on the determination of sample sizes. For example, at a 90 percent confidence level and a required precision of 5 percent and 7.5 percent, the optimal sample size for a population of 300 is 143 and 86, respectively; a population size of 400 yields sample sizes of 162 and 93, respectively. Thus, with our population of 360, the sample size would be 155 at 5 percent precision.

However, given the generally low response rates in firm surveys recorded in Ghana, we decided to sample at least 50 percent of the total number of FDI manufacturing firms. This was to ensure a higher probability of selection for firms in the target population. Thus, 50 percent of firms in each regional stratum were randomly selected. In addition, two extra firms from each region with the exception of Greater Accra were selected randomly. The idea was to increase the probability of representation of firms in the four other regions, which have relatively fewer firms compared to Greater Accra. At the end of this process, a total of 190 firms were identified for the survey. As stated earlier, the single objective of oversampling was to avoid a low response rate. Another reason for choosing a larger sample size is to reduce the sampling error in the survey. Table 4.4 shows the distribution of the sample by each stratum as well as information on sampling fraction, number of firms that refused to participate in the survey, the number that could not be located or had shut down, those that were unable to be reached because of the constraint of time, and the number of complete and incomplete questionnaires. During the survey, firms that had closed down or could not be located were substituted with an equal number of firms from the specific population stratum. The substitute firms were also drawn using simple random sampling.

Table 4.4: Report on the Distribution of Firms by Stratum, Non-Response and Outcomes from the Fieldwork

	Population Measures			Non-Response			Outcome	
Stratum: (Administrative Region)	**Total FDI Firms**	**Target Sample**	**Sampling Fraction (%)****	**Refusals**	**Inability to Reach due to Time Constraint**	**Incomplete/Unusable Questionnaires**	**Complete Questionnaires**	**Response Rates by Strata and for Total Sample (%)**
Western	19	12	63.16	3	---	4	5	41.67
Central	11	8	72.73	4	---	3	1	12.50
Greater Accra	284	142	50.00	51	12	24	55	38.73
Eastern	15	10	66.67	2	2	4	2	20.00
Ashanti	31	18	58.06	6	1	6	5	27.78
Northern*	3	---	---	---	---	---	1	---
Total	**363**	**190**	**---**	**66**	**15**	**41**	**69**	**36.32**

Source: Author's own computations

* The firms in Northern region were not included in the target sample, but one firm participated in the survey because its headquarters was located in Accra.

** The Sampling Fraction is the ratio of the Target sample to total number of FDI firms

Table 4.5: Summary Percentages of Survey Outcomes

Survey Measures	**Percentages**
Total Target Sample Fraction	58.13
Response Rate	36.32
Total Non-Response Rate	63.68
Refusals as percent of Total Non-Response	54.55
Inability to Contact as percent of Total Non-Response	12.40
Incomplete Questionnaires as percent of Total Non-Response	33.88

Source: Author's own computations

4.4.10 Non-Response

De Leeuw et al. (2008) define non-response as the inability to obtain data for all sampled units on all questions. But there is a distinction between total (or unit) non-response and item non-response. Total (unit) non-response is the failure to obtain any information from an eligible sample unit, because of refusal to participate or failure to make contact. On the other hand, item non-response or item missing data is the inability to secure information for one or more questions in the questionnaire, given that other questions are completed (Kalton 1983: 64; Jolliffe 1986: 61; de Leeuw et al. 2008). In our survey, total non-response is measured as the sum of the number of firms that refused to participate in the survey, those that could not be interviewed due to time constraint, and those for which interviews were incomplete (and therefore responses to questions were too few to be useful in subsequent statistical analysis).

Table 4.4 also reports the outcome of the survey in terms of non-response and response by each stratum. There were 69 valid and useful questionnaires, thus representing a response rate of approximately 36. On the contrary, the total number of firms that either refused to participate in the survey, could not be contacted, or for which responses were inadequate to be useful for analysis was 122, representing a total non-response rate of approximately 64 percent. Of this total, item non-response rate was 33.60 percent, whilst the unit non-response rate was 66.40. But the dominant cause of non-response was refusals by firms to participate in the survey. A total of 66 firms (approximately 54 percent of total non-response) refused to participate in the survey. The other cause of non-response was the inability to make contact with firms because of the constraint of time. The number of firms that could not be reached at all was 15 (12.30 percent of total non-response). Table 4.5 presents a summary of these survey measures.

Despite the high rate of non-response, it is important to point out that the sample size chosen was very large relative to the population. The intention was to interview as many respondents as possible and hence minimise the occurrence of a high non-response rate. In hindsight we were probably overly ambitious in our expectations regarding the number of firms that could actually be contacted and therefore interviewed. Nonetheless, on the positive side, there is great satisfaction in being able to interview nearly 58 percent of firms, 110 out of 190 firms, although only 69 questionnaires were usable in the end.

Nonetheless, our survey response rate compares favourably with that obtained by the UNIDO FDI survey in 2005, which in the case of Ghana recorded a response rate of 34.7 percent although the number of usable questionnaires and therefore number of firms was 42 (with 20 firms categorised as manufacturing). Table 4.6 reports the response rate by country for the UNDO African Foreign Investor Survey in 2005 for all fifteen countries. Of the 3,484 questionnaires sent out to companies, 1,216 useable questionnaires were returned, representing a response rate of approximately 35 percent. We also observe a wide variation in the useable response rate by country. The lowest response rate of 23.0 percent was recorded for Cote d'Ivoire, whilst the highest of 80.5 percent was recorded in Mali. In 11 out of the 15 countries, the response rate was lower than 50 percent.

Table 4.6: UNIDO African Foreign Investor Survey 2005: Response Rate by Country

	Questionnaires Sent Out to Companies	**Usable Questionnaires Returned**	**Total Questionnaires Returned**	**Response Rate of Usable Returns**
Burkina Faso	295	99	99	33.6
Cameroon	184	64	65	34.8
Cote d'Ivoire	226	52	52	23.0
Ethiopia	120	76	76	63.3
Ghana	121	42	47	34.7
Guinea	104	50	50	48.1
Kenya	376	104	105	27.7
Madagascar	243	86	86	35.4
Malawi	128	80	81	62.5
Mali	77	62	65	80.5
Mozambique	408	140	145	34.3
Nigeria	499	118	121	23.6
Senegal	201	61	63	30.6
Tanzania, UR	154	88	89	57.1
Uganda	348	94	97	27.0
TOTAL	**3484**	**1216**	**1241**	**34.9**

Source: African Foreign Investor Survey 2005 (UNIDO 2007: 9)

The following reasons can be assigned for the high rate of non-response recorded in our survey. These are, failure to locate or make contact with a firm, firms had folded up, six firms had stopped operations at least two years prior to the survey year (although the general managers in each of these firms indicated the closure was to

re-tool and re-organise), and firms that simply refused to participate in the survey. In the case of firms that refused to participate in the survey, the managers gave a number of reasons for their non-participation. These are, being too busy to be bothered by the research issues, having little or no time for interviews, disinterest in academic research, and research/survey fatigue. Although not stated by managers, it was my conviction that a significant number of managers declined to be interviewed because of my positionality; the power relations between the managers and me meant I was unable to provide any incentive to ensure their participation.

4.4.11 Implications of Non-Response

Whilst the use of probability sampling avoids the occurrence of selection bias, inability to make contact or collect survey information from sampled elements constitute another source of bias in survey analysis. Non-response introduces non-sampling bias into survey findings, (Fink 2003: 26; Jolliffe 1986: 61), and as Kalton (1983: 63) notes, the problem of non-response seems to have become widespread because the public has become less willing to participate in surveys. The major cause for concern with regard to non-response (and the source of the bias) is the danger associated with the possibility that non-respondents might differ in a systematic way from those that respond in a survey, thus affecting the accuracy of sample estimates and findings (Kalton 1983: 63; Jolliffe 1986: 61). And as Kalton (*ibid*: 64) further argues, it is dangerous in practice to regard non-response as occurring randomly, thus suggesting the possibility of a systematic pattern underlying such occurrence.

But Weisburg and Bowen (1977: 36) note that although non-response can be a problem, those who refuse to participate do not differ too much from those who participate (other than being less cooperative). Further, as argued by Barnett (1991: 58) different subjects of enquiry and different methods of data collection inevitably result in different non-response rates, which may not relate directly to the extent of error engendered by the non-response. The degree of bias will depend on how typical (or atypical) is the non-responding group of the population as a whole.

Although we are aware of the problems that could arise from non-response, we also note that without a complete enumeration of the true population and a priori information on the type of firms that are unlikely to cooperate in a survey, it is difficult

to estimate accurately the size of the bias introduced as a result of non-response. A way to resolve the potential problems of non-response is to take measures that ensure that the non-response rate is as small as possible. But what is clear from our survey is the high rate of total non-response in spite of the strenuous efforts put in to minimise its occurrence. The very obvious consequence of such a high non-response rate is the reduced sample size and the potential decrease in the precision of sample estimates. Nonetheless, this outcome is not unusual with firm surveys in general and with those carried out in Africa in particular, as with the example of the UNIDO survey.

4.5 Summary and Conclusion

In this chapter we set out to discuss the methodology for conducting fieldwork in Ghana. The main objectives of the fieldwork were to collect firm level data on FDI manufacturing firms through the use of interview-schedules, and to gather secondary data necessary to achieve the specific objectives of this research. In addition to defining a few concepts and terms useful for this research, we also discussed in detail several aspects of the fieldwork, in particular the development of the survey instrument by drawing on the experiences from other surveys on firms in SSA, the challenges involved in its administration, and the outcome of the survey.

The task of carrying out a survey is usually daunting, and is most especially the case with surveys on firms. In the presence of existing datasets by large organisations, an argument can be made against the conduct of a relatively small-scale survey as in our case. But we have argued that these datasets have gaps in them and thus are inadequate considering the objectives of the research. Thus, the need to fill these gaps renders this argument against conducting a relatively small-scale survey weak. In our view, the outcome of the survey has been relatively gratifying in the light of the constraints faced during fieldwork, and we consider the experiences obtained useful training for future field studies and other forms of surveys in developing countries.

The next three chapters represent the empirical findings of this study. These findings are based on data obtained from our survey complemented with other survey data on Ghana. Chapter 5 presents descriptive statistics of FDI manufacturing firms based on data from our survey. In the subsequent two chapters, we use data from our

findings in Chapter 5 complemented with data from RPED and GMES and the World Bank Enterprise survey to address the main research objectives.

Chapter 5

Characteristics of Foreign Direct Investment Firms in Ghanaian Manufacturing

5.0 Introduction

This is the first of three chapters presenting the empirical findings of this study. In this chapter, we present descriptive statistics on FDI manufacturing firms using data obtained from our survey in Ghana. In total there were 69 questionnaires with responses that were good enough to merit any useful and meaningful analyses. The main descriptive statistics presented are distributions for important firm characteristics identified from the survey data. These characteristics include location, age of firms and business start-ups, source countries of FDI firms, ownership characteristics, ISIC product categories and employment, firm size, FDI source, exporting behaviour and other characteristics that have been argued to be associated with FDI firms, such as R&D activity, activities relating to improving productivity, and the training of employees.

In the methodology chapter, we indicated that because our survey focused exclusively and entirely on FDI manufacturing firms, direct comparison with domestic firms cannot be carried out using our survey data. Thus, we utilise information from the RPED and GMES dataset available from the CSAE at Oxford University and the World Bank's Enterprise Survey dataset for 2007 (both on Ghanaian manufacturing) to undertake a quasi-direct comparison between FDI and domestic firms. Furthermore, to assess whether our survey findings are consistent with previous surveys, particularly those on FDI firms in Ghana we conduct a comparison, where possible, between the findings from our survey and those from the UNIDO survey results on Ghana.

5.1 Firm-Specific Characteristics of FDI Manufacturing Firms

In this section, we present basic statistical distributions of important firm-specific characteristics of FDI manufacturing firms using data obtained from our survey. The descriptive statistics of these firm-specific characteristics will rely mostly on frequency distributions, percentages/proportions, and the mean, median and modal characteristics for each of the individual variables.

5.1.1 Location of Firms

Approximately 80 percent of FDI firms were located in the Greater Accra region (Table 5.1). This observation is however unsurprising; we had noted in the previous chapter, that the majority of firms from which the sample was drawn were located in the Greater Accra region. The predominance of firms in the Greater Accra region can be explained because the the region seats the political, administrative and commercial capital of Ghana, Accra. Hence, it is home to every government and quasi-government institution and agency. Additionally, the port city of Tema, which is also located in the Greater Accra region, is 22km from Accra and serves as an industrial hub. In fact under the 7–Year Development plan of the Nkrumah administration, Tema became an industrial city, where several large-scale manufacturing plants and an aluminium smelter were established. The combination of these pull factors has drawn many enterprises to set up business in the Greater Accra region.

Table 5.1: Location of FDI Firms

Location	Frequency	Valid Percent
Greater Accra Region	55	79.7
Ashanti Region	5	7.2
Western Region	5	7.2
Central Region	1	1.4
Eastern Region	2	2.9
Northern Region	1	1.4
Total	**69**	**100.0**

Source: Computed from own survey

We also observe that three regions, Greater Accra, Ashanti and Western account for 94 percent of total firms interviewed. These three regions are the most urbanised in Ghana, with Kumasi in the Ashanti region and Takoradi in the Western region being

the second and thirds largest cities, respectively. Overall the 69 FDI firms surveyed were distributed over six administrative regions. However, in the case of one firm, located in the Northern region, the interview was conducted at the head office of the company located in Accra although the site of the factory was located in the Northern region.

We are unable to compare directly the distribution of firms by location between our survey and that of the UNIDO 2005 survey because there was no information on location in the latter. Nevertheless we are able to use information from the wave 5 of the RPED and GMES and the WBES for Ghana, to compare if the distribution of FDI firms by location has been significantly biased. Tables 5.2 and 5.3 report the distribution of manufacturing firms by location based on data from the RPED and GMES and the WBES, respectively. These two surveys were however concentrated in four regional capitals. Three regional capitals were consistently covered by both surveys, that is, Accra-Tema, Kumasi and Takoradi. However with regard to the fourth survey area, the (RPED and GMES) covered Cape Coast in the Central region while the WBES covered Tamale in the Northern region.

Table 5.2 reports the distribution of manufacturing firms by location from the RPED and GMES. This shows the dominance of manufacturing firms in the Greater Accra and Ashanti regions, which is similar to the pattern observed in our survey. Table 5.3 also presents the distribution of firms by location from the WBES for the full sample and for only manufacturing firms. In Tables 5.2 and 5.3, we observe that at least 56 percent of manufacturing firms are located in the Greater Accra region.

Table 5.2: Location of Firms (RPED and GMES Wave 5)

LOCATION (REGION)	FREQUENCY	VALID PERCENT
Accra (Greater Accra)	103	56.9
Kumasi (Ashanti)	59	32.6
Cape Coast (Central)	6	3.3
Takoradi (Western)	13	7.2
Total	**181**	**100.0**

Source: Computed from RPED/GMES wave 5

Table 5.3: Location of Firms – Full sample and Manufacturing sample (World Bank Enterprise survey, Ghana)

Location (Region)	Frequency (Full sample)	Valid Percent (Full sample)	Frequency (Manufacturing)	Valid Percent (Manufacturing)
Accra–Tema (Greater Accra)	373	60.6	195	62.3
Kumasi (Ashanti)	120	19.5	56	17.9
Tamale (Northern)	63	10.2	34	10.9
Takoradi (Western)	60	9.7	28	8.9
Total	616	100.0	313	100.0

Source: Computed from World Bank Enterprise survey, 2007

With regard to the distribution of foreign manufacturing firms, the data available for RPED and GMES (waves 1, 2, 3, 4 and 5), show that nearly 78 percent of FDI firms were located in the Greater Accra region, with 11 percent located in the Ashanti and Western regions, respectively.[38] The World Bank Enterprise survey data on manufacturing activity also reveals that 90 percent of foreign firms were located in the Greater Accra region. The other 10 percent were located in the Ashanti region.

Based on the observed patterns of the distribution of foreign firms in the RPED and GMES and WBES, it is evident that the distribution of FDI firms reflects the general pattern of distribution for foreign and domestic manufacturing firms in Ghana. Further confirmation that foreign firms are more likely to be based in the Greater Accra and Ashanti regions is seen in the distribution of firms with *foreign owners* from the Industrial census of 2003. Table 5.4 reports the distribution of foreign manufacturing firms by location, which clearly indicates the predominance of firms located in the Greater Accra region.

[38] We use the term foreign firms to refer to manufacturing firms in the RPED and GMES and WBES with at least 10 percent foreign equity. Foreign firms are thus distinct from FDI firms, which refer to firms from our survey.

Table 5.4: Percentage Distribution of Firms with Foreign Ownership

Region	Percentage Distribution
Ashanti Region	11.72
Brong Ahafo Region	4.09
Central Region	2.45
Eastern Region	2.72
Greater Accra Region	65.12
Northern Region	2.45
Upper East Region	0.27
Upper West Region	0.54
Volta Region	1.63
Western Region	8.99
Total	100.00

Source: Ghana Statistical Service, 2003 Industrial Census

5.1.2 Business Start-ups and the Age of Firms

Business Start-ups

Almost all the firms in the survey were established as a direct result of FDI activity; 94 percent of FDI firms were established as a result of greenfield investments. The remaining 6 percent were the result of brownfield investment, which resulted from the divestiture and privatisation of previously state-owned enterprises under the Government of Ghana's Divestiture Implementation Programme, which began in 1988.

Before we proceed, it is important to stress that information in the preceding paragraph about the establishment and mode of entry of FDI firms refer to initial start-up conditions. During some of our interview sessions, we learnt that over the course of time some FDI manufacturing firms, which were previously greenfield investments, have witnessed increased equity participation of Ghanaian private investors. Consequently, the equity and ownership structure have changed from wholly-owned FDI firms when their enterprises were established to become joint ventures. Further, it can be argued that firms in the sample represent those that have survived since they were established, because there is no way of determining how many firms have failed or exited the industry; no information is available on the number of firms that exit the manufacturing sector after start-up.

Based on information on the year in which a firm was granted its certificate of incorporation, thus defining the firm as a legal entity, we find that FDI firms were established between 1956 and 2007, with 1998 as the modal year. Approximately 87 percent of FDI firms were established in the post economic reform era (post 1984). On the other hand if we examine business start-ups pre and post the current democratic dispensation in Ghana, which began in 1993, we find that 75 percent of firms were established from 1993 onwards, whilst 25 percent were established before 1993.

What is evident is the large number of firms established in the period after the commencement of economic and democratic reforms in Ghana. Although this finding is not entirely conclusive of the argument that the political and institutional environment in host countries, such as the presence of a democratic and a liberal economic environment, are important factors in determining the level of foreign investment inflow to a country, it is a pointer to the argument in the literature on the determinants of FDI inflows especially to developing countries – see for example, (Asiedu 2002; Gyimah-Brimpong and Traynor 1999; Udomkerdmongkol and Morrissey 2008; Ajayi 2006; Tsikata et al. 2000) – regarding the importance of political and institutional factors.

It also important to point out, that the increasing number of foreign investments since the mid-1990s reflects the changes in FDI inflows to the SSA region compared to the pattern observed in the previous two decades, when inflows were very minimal and restricted largely to resource-rich sectors in a few countries. According UNCTAD (1995), inflows of FDI increased from an annual average of $1.7 billion during 1981 – 1985 to an average of almost $3 billion during 1986–1990, with inflows rising steadily since the mid-1990s UNCTAD (2000).

Comparing our findings in respect of business start-ups with the UNIDO 2005 survey, we find a similar pattern. Of the 42 FDI firms in the UNIDO sample, nearly 10 percent were established on or before 1980, 62 percent between 1991 and 2000, and approximately 28 percent after 2001. In other words, over 70 percent of firms in the UNIDO sample were established after 1991. Thus, the evidence from both datasets reveals that the majority of FDI firms were established after 1990.[39] We can only speculate that this finding is a consequence and a reflection of the increased interest by

[39] We also find a similar pattern for FDI manufacturing firms in the World Bank Enterprise survey on Ghana where nearly 60 percent of these firms were established after 1990.

foreign investors in the SSA region after the 1990s. But it could also be the result of the sea change in the economic and socio-political environment of many SSAs driven by policies under the Washington and Post-Washington Consensus, which gained momentum at the beginning of the 1990s. The 1990s also coincided with the period that witnessed a surge in economic integration among countries via trade, usually termed globalisation.

Age of Firms

The age of FDI firms is computed by taking the difference between the date a firm was officially established and the reference year for the survey, which is 2008. It is worth noting that firms may officially be registered to commence business in a particular year, but may actually commence production at a later date. Thus, the age referred to in this section captures the legal age.

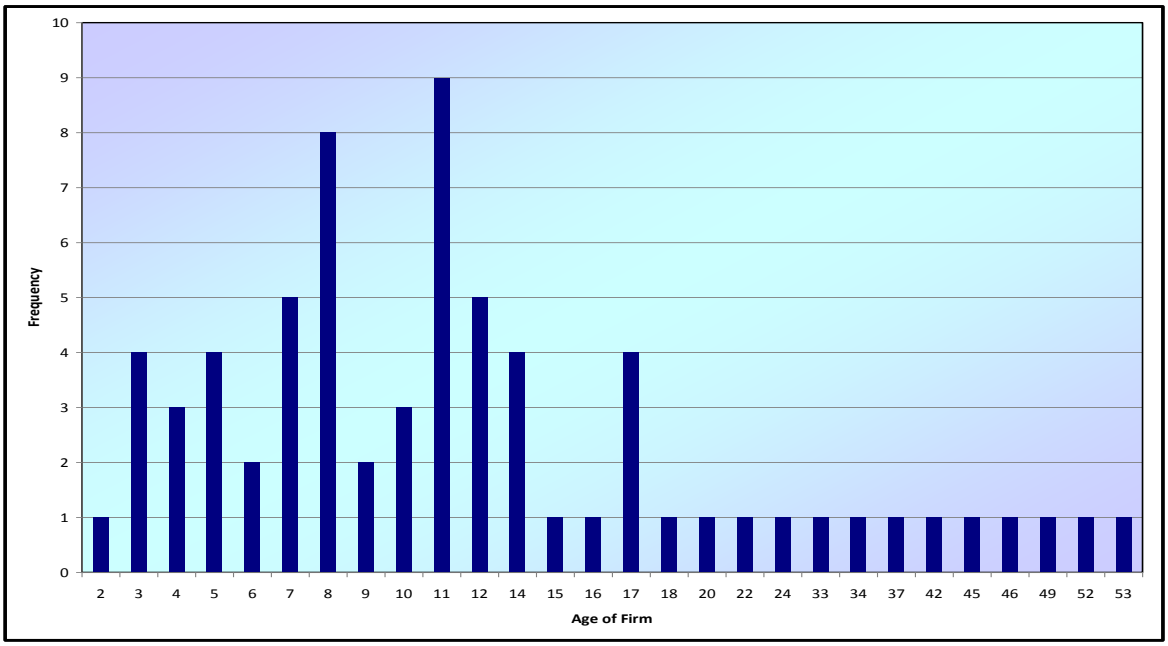
Figure 5.1 presents the distribution of the age of FDI firms, whilst Table 5.5 presents summary statistics on the age distribution. The range for the age of firms is between two and fifty-three years, with an average age of fourteen years. The modal and median age of firms is eleven years. Nearly 70 percent of firms surveyed were less than sixteen years of age, whilst only 13 percent are aged over thirty years. The choice of thirty years, though arbitrary, is intended to provide an indication of the level of maturity of firms. Given that Ghana has been an independent country since 1957, we argue that firms that have been in existence for at least thirty years would have acquired sufficient experiences over the years to be regarded as matured. The evidence suggests that most of the FDI firms are relatively young.

Table 5.5: Summary Statistics on Age of Firms

Mean	Median	Mode	Std. Deviation	Variance	Range	Minimum	Maximum
14.4058	11	11	12.48919	155.98	51	2	53

Source: Author's computation using own survey data

Figure 5.1: Age Distribution of Firms



Source: Computed from own survey

5.1.3 Source Countries of FDI Firms

As stated earlier, 94 percent of FDI firms were established as greenfield investments, with the remainder brownfield investments. However, the source countries of FDI projects to Ghana are diverse. Traditionally, most FDI had come from a few OECD countries, such the United Kingdom, France, Germany and the United States, with the bulk coming from the United Kingdom because of colonial ties. However, in recent years the picture has been changing. The rise of Asia, particularly countries from East Asia and in recent years China and India, as well as other emerging economies has resulted in greater diversity of FDI to Ghana.

Table 5.6 presents FDI firms by country of origin. In terms of number of firms, India, China and Lebanon in that order represent the countries with the largest representation. The three countries together constitute approximately 49 percent of FDI projects by country of origin. In spite of the dominance by these three countries, there are several other countries represented from various parts of the world, except for Latin America. The trend in sources of FDI projects observed in Ghana is no different from what is happening across many SSA countries. The importance of non-traditional sources of FDI inflows to Africa was highlighted by the UNCTAD (2000) report entitled *Cross Border Mergers and Acquisitions and Development*, which showed

notable increase in flows from countries such as Korea, China, India, Malaysia and Taiwan. The World Investment Report for 2010 also notes that FDI flows from developing Asia to Africa now account for the major part of interregional flows among developing countries, with Chinese investors in particular becoming the most significant foreign investors in some SSA countries while investments from India and Malaysia follow closely. The number of FDI projects does not necessarily provide information on the value of FDI inflows. Unfortunately, we were unable to obtain information from the survey on the value of FDI projects.

Table 5.6: FDI Firms by Country of Origin

Source Country	Frequency	Valid Percent
India	14	20.3
China	11	15.9
Lebanon	9	13.0
Britain	5	7.2
Switzerland	5	7.2
USA	4	5.8
Italy	3	4.3
Norway	3	4.3
Germany	2	2.9
Korea	2	2.9
Malaysia	2	2.9
Spain	2	2.9
The Netherlands	2	2.9
Denmark	1	1.4
Egypt	1	1.4
France	1	1.4
Nigeria	1	1.4
Philippines	1	1.4
Total	**69**	**100.0**

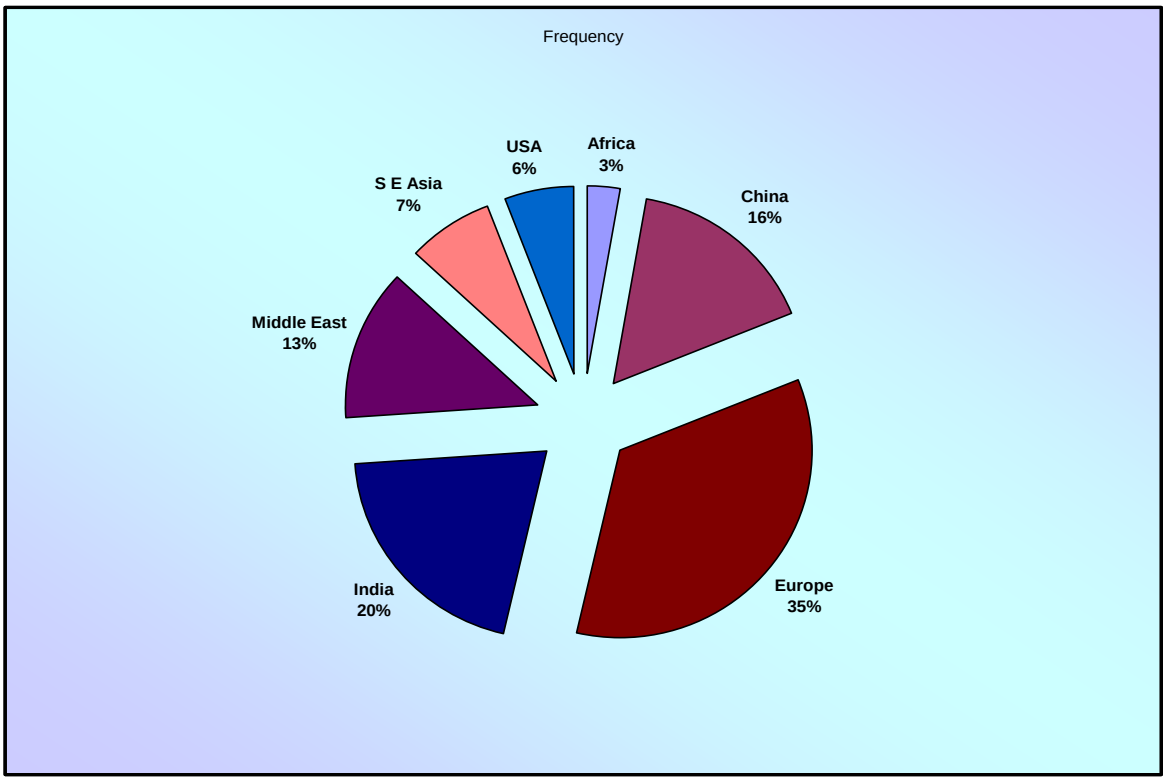
Source: Computed from own survey

If the source countries of FDI firms are categorised by broad geographical regions then the single largest source region for investments in Ghana's manufacturing sector is Asia (which comprise countries from East and South East Asia, China and India), representing approximately 44 percent, with India and China alone accounting for nearly 36 percent. This pattern is illustrated in Figure 5.2 and Table 5.7. The growing importance of Chinese and Indian FDI in Ghana, as well as their dominance in

the Ghanaian manufacturing sector, at least by the number of investment projects have been highlighted in recent quarterly publications of the GIPC.

The GIPC (2011) fourth quarter report for 2010 indicates that for the period January – December 2010, China and India were the single largest source countries of FDI projects to Ghana. These were followed by Nigeria, Lebanon, Britain, USA and Mauritius in that order. It is worth pointing out that these FDI projects are ranked by number of investment projects but not the value of these projects.

Figure 5.2: FDI by Source Region (with China and India treated separately)



Source: Computed from own survey

Table 5.7: FDI by Source Broad Geographical Region

Source Regions	Frequency	Valid Percent
Asia	30	43.5
Europe	24	34.8
Middle East	9	13.0
USA	4	5.8
Africa	2	2.9
Total	**69**	**100.0**

Source: Computed from own survey

A comparison of our findings regarding sources of FDI firms with that from the UNIDO 2005 survey shows a similar pattern of diversity and the emerging dominance of investments from developing countries, particularly from Asia. Table 5.8 presents the distribution of foreign investments by origin of investor using data from the UNIDO 2005 survey.[40] The origin of investors are categorised as either 'North' representing Europe, North America and other parts of the developed world, and 'South' representing newly industrialising countries and developing countries. We observe in Table 5.8 that approximately 53 percent foreign investment projects originate from the 'South', with investment projects from Asia representing the majority of investments from the 'South' (see Table 5.9).

Table 5.8: Origin of Investor, UNIDO

Origin of Investor	Frequency	Valid Percent
North	19	47.5
South	21	52.5
Total	**40**	**100.0**

Source: UNIDO FDI Survey on Ghana, 2005

Table 5.9: Region of Investor, UNIDO

Region of Investor	Frequency	Valid Percent
Europe	15	37.5
Asia	10	25.0
Sub Saharan Africa	5	12.5
The Americas and Oceania	5	12.5
Middle East and Northern Africa	3	7.5
South Africa	2	5.0
Total	**40**	**100.0**

Source: UNIDO FDI Survey on Ghana, 2005

5.1.4 Organizational Structure of FDI Firms

We follow the approach of UNIDO (2007) by categorising FDI firms according to organisational structure. Firms are classified according to the global reach of their parent company and the estimated sales. Large multinational enterprises (L-MNEs) are those which have a global presence in at least every continent and sales turnover in excess of $200 million. An example of an L-MNE is Coca-Cola. We classify small

[40] The distribution in Table 5.8 is for all foreign investment projects irrespective of the sector of the economy the investment project is located.

multinational enterprises (S-MNEs) as firms with a limited global presence, usually in a few countries on a couple of continents and global sales below $200 million. Firms classified as foreign entrepreneurs are those set up by private foreign investors with no links to L-MNEs, S-MNEs or subsidiaries associated with either category of MNEs.

Table 5.10 presents the distribution of FDI firms according to their organisational structure. The majority of FDI firms, 65 percent, are of the foreign entrepreneur type, with the remainder almost evenly split between S-MNEs and L-MNEs category. The predominance of a large number of foreign entrepreneurs in our sample is not unique to Ghana. The UNIDO 2005 survey reveals that for the entire sample of 1216 FDI firms in 15 countries, 50 percent were of the foreign entrepreneur type. The increased presence of foreign entrepreneurs reveals the changing nature of foreign direct investments in SSA. UNIDO (2007) observes that these foreign entrepreneurial projects are usually small- and medium-sized firms set up by private individuals or members of families. Kaplinsky and Morris (2009) also provide an example of Chinese investments of this kind in SSA. They observe that these private individual or family-financed firms may be incorporated in China and extend their operations from China to SSA or may have started right away in SSA.

Table 5.10: Organisational Structure of FDI Firms

	Frequency	Valid Percent
Foreign Entrepreneur	45	65.2
Large-Multinational Enterprise	11	15.9
Small-Multinational Enterprise	13	18.8
Total	69	100.0

Source: Computed from own survey

Table 5.11 presents the distribution of FDI firms by organisational structure and source regions of FDI. We find that the L-MNEs originate from Europe and USA, which is not unexpected, whilst most of S-MNEs originate from Europe and India. With regard to foreign entrepreneurial firms, we find that the majority originate from developing countries and newly industrialising countries in South East Asia.

Table 5.11: Organisational Structure of FDI Firms by Source Region of FDI

Organisational Structure	Africa	China	Europe	India	Middle East	S E Asia	USA	Total
Foreign Entrepreneur	2	10	10	8	9	5	1	**45**
Large-MNE	0	0	8	0	0	0	3	**11**
Small-MNE	0	1	6	6	0	0	0	**13**
Total	**2**	**11**	**24**	**14**	**9**	**5**	**4**	**69**

Source: Computed from own survey

5.1.5 Ownership and Management Characteristics of Firms

In previous surveys on Ghana (a few of which were discussed in Chapter 4), particularly those not on FDI firms, ownership characteristics have been used as the basis for classifying firms either as foreign (and by implication FDI) or domestic (non-FDI). However in our survey, all firms are the result of FDI activity and thus our emphasis here is to examine the relative shares of foreign vis-à-vis Ghanaian investors in the ownership structure of firms. The definition of ownership is based on the reported equity distribution between a foreign investor and a Ghanaian investor. A wholly-owned foreign firm is one in which 100 percent equity is owned by a foreign investor(s). On the other hand, a joint venture firm is one in which the equity share is between a foreign and Ghanaian investor.

Our survey data reveal that nearly 62 percent of firms are wholly-owned foreign operations, with nearly 38 percent being joint venture operations with Ghanaian private entrepreneurs or the government (see Table 5.12). In the case of joint ventures, we observe that Ghanaian private investor equity ranges from 3 to 84 percent. There are only three FDI firms with greater Ghanaian equity – more than 50 percent of equity – compared to foreign equity, and another three with an equal share of equity between Ghanaian and foreign investors (see Table 5.13).

This finding is in contrast with the UNIDO 2005 survey on Ghana where there were as many wholly-owned foreign firms as joint venture firms. In the UNIDO survey, nearly 48 percent of firms in their sample were wholly-owned foreign operations, with the remainder joint ventures between foreign investors and private Ghanaian investors.

Table 5.12: Ownership of Firms

Ownership Type	Frequency	Valid Percent
Wholly Owned Foreign	43	62.32
Joint Venture with Ghanaian	26	37.68
Total	**69**	**100.0**

Source: Computed from own survey

Table 5.13: Equity Distribution of Firms

Foreign Equity (%)	Ghanaian Equity (%)	Frequency	Percent
100	0	43	62.32
97	3	1	1.45
90	10	1	1.45
80	20	2	2.90
75	25	1	1.45
70	30	6	8.70
63	37	1	1.45
60	40	7	10.14
59.5	40.5	1	1.45
50	50	3	4.35
40	60	2	2.90
16	84	1	1.45
		69	**100**

Source: Computed from own survey

The equity structure between foreign and Ghanaian investors is not mirrored in the distribution of foreign and Ghanaian personnel at the top level of management in FDI firms. Table 5.14 presents data on the top level management structure of firms. Whilst we observed in Table 5.13 that 62 percent of firms had 100 percent foreign equity, in Table 5.14 we find that in approximately 6 percent of FDI firms the top level managers are all foreigners. However, this does not suggest that in 94 percent of FDI firms, Ghanaians are dominant at the top level of management. A closer examination of Table 5.14 reveals a rather nuanced picture.

The representation of Ghanaians in senior management positions ranges from 5 to 98 percent. Nonetheless, it is only in 26 percent of firms where we find at least 50 percent of senior managers being Ghanaian. What this clearly shows is that in approximately 74 percent of firms the proportion of foreign managers at the top level exceeds 50 percent. This finding contrasts sharply with that found by Lall (2003) in a study on FDI in Lesotho. Lall found that in all the firms there were no Lesotho nationals employed in any management position. Locals were only employed as

production workers, with very few in supervisory positions; there were none employed from middle-level management upwards.

Table 5.14: Top Level Management Structure in Firms

Foreign Management (%)	Ghanaian Management (%)	Frequency	Percent
100	0	4	5.80
95	5	6	8.70
90	10	20	28.99
80	20	8	11.59
70	30	3	4.35
60	40	10	14.49
50	50	3	4.35
40	60	6	8.70
30	70	1	1.45
20	80	6	8.70
10	90	1	1.45
2	98	1	1.45
		69	**100.00**

Source: Computed from own survey

Given the relatively high representation of Ghanaians at the top level of management, there exists the possibility for greater interaction between senior foreign and Ghanaian managers in firms. With such possibilities for interaction the potential for transfer of skills and technological knowledge is higher. However, this depends on whether there are formal mechanisms in place within firms to facilitate such a transfer. Whilst the dynamics involved in knowledge transfer are difficult to measure in a snapshot questionnaire, we rely on information on the extent of training provided to top level Ghanaian managers by firms to gauge the extent of knowledge transfer as a result of FDI activity.

5.1.6 The Product/Industry Categories of Firms

In the questionnaire, there was no attempt to pre-code the products produced or to select firms based on the specific industry in which they operated. This is because firms were not chosen by industry or product group. Thus, the question in the questionnaire on the type of products produced by firms was left open. Once these responses for products produced were obtained they were classified using the United

Nations standard International Standard Industrial Classification (ISIC) of All Economic Activities.[41]

Initially, the products produced by FDI manufacturing firms were classified using the 4–digit ISIC code, which yielded thirty-five different product categories. However, this was too large a number, and in order to reduce the number of product categories we used the 3–digit ISIC code to classify the products produced. This resulted in a further reduction in the number of product categories from thirty-five to nineteen. However, we were still of the view that this represented too wide a range in product categories, hence the need to use the 2–digit ISIC code. Consequently, the number of product categories reduced from nineteen to eight.

Table 5.15 shows that the largest product categories are Food, Beverages and Tobacco (28 percent) and Chemicals, Plastics and Rubber (23 percent). These are followed by the Basic Metals and Fabricated Metals group (13 percent) and Textiles and Leather products (10 percent). Table 5.15 reveals that the FDI manufacturing firms that were surveyed operate in a broad range of industries. The range of firms covered in our survey is similar to that in the UNIDO 2005 survey and the World Bank Enterprise survey, 2007.

Table 5.15: Main Product Categories based on 2 – digit ISIC code

Product Categories	**Frequency**	**Percent**
Food, Beverages and Tobacco	19	27.5
Textiles and Leather Products	7	10.1
Wood and Furniture Products	6	8.7
Paper, Printing and Publishing	2	2.9
Chemicals, Plastics and Rubber Products	16	23.2
Other Non-Metallic Mineral Products	6	8.7
Basic Metals and Fabricated Metal Products	9	13.0
Manufacture of Machinery and Other Equipment	4	5.8
Total	**69**	**100.0**

Source: Computed from own survey

[41] The ISIC classification can also be used define industry groupings. In this discussion we use product categories and industry grouping interchangeably.

In Tables 5.16, 5.17 and 5.18, we present information on the main industry groupings from which firms were surveyed in the UNIDO 2005 survey and the WBES. The evidence from the two surveys reveal a close parallel between our survey findings in respect of the range of industry (especially in the case of foreign firms, see Table 5.18). A closer examination of Tables 5.16 and 5.18 reveals the dominance firms in the Food and Beverages, and Chemicals, Plastics and Rubber sectors.

Table 5.16: Main Product Groups from UNIDO Survey, 2005

Product Groups	**Frequency**	**Percent**
Food, beverages and tobacco	4	20.0
Garment, apparel and leather	1	5.0
Paper and paper products	1	5.0
Chemicals, plastics and rubber	8	40.0
Non-metallic mineral products	3	15.0
Auto, machinery and equipment	2	10.0
Wood products and furniture	1	5.0
Total	**20**	**100.0**

Source: UNIDO FDI Survey on Ghana, 2005

Table 5.17: Main Product Groups from World Bank Enterprise Survey (All Manufacturing), 2006

Product Group	**Frequency**	**Valid Percent**
Food	80	25.6
Textiles	4	1.3
Garments	124	39.6
Chemicals	7	2.2
Plastics and Rubber	6	1.9
Non-metallic Mineral Products	8	2.6
Fabricated Metal Products	21	6.7
Machinery and Equipment	5	1.6
Electronics	1	0.3
Other Manufacturing	57	18.2
Total	**313**	**100.0**

Source: World Bank Enterprise Survey on Ghana, 2007

Table 5.18: Main Product Groups from World Bank Enterprise Survey (FDI), 2006

Product Group	Frequency	Valid Percent
Food	6	28.57
Textiles	0	0.00
Garments	1	4.76
Chemicals	3	14.29
Plastics and Rubber	6	28.57
Non-metallic Mineral Products	0	0.00
Fabricated Metal Products	0	0.00
Machinery and Equipment	1	4.76
Electronics	0	0.00
Other Manufacturing	4	19.05
Total	**21**	**100.00**

Source: World Bank Enterprise Survey on Ghana, 2007

By comparing the distribution of FDI firms by industry groups with other (foreign) manufacturing firms from these other surveys we note that the sample we obtained exhibits similar characteristics to firms operating in the manufacturing sector as a whole, and more specifically to other foreign firms operating in the manufacturing sector. The evidence also appears to suggest a preference by foreign investors to establish investment projects in certain industries in the manufacturing sector, notably Food and Beverages and Chemicals and Plastics. This observation however requires further research work to determine what factors influence the industry-location decisions of foreign investors in the Ghanaian manufacturing sector.

5.1.7 Employment Characteristics of Firms

One of the benefits that FDI is expected to bring to recipient countries, is the generation of employment. Very often, as in the case of Ghana, FDI projects indicate the estimated number of persons to be employed when applying for licences from the GIPC to operate as enterprises. There is however no information available either from the GIPC or other official state agencies on the extent to which these *optimistic* projections of employment generation by FDI projects actually materialise after they are established. Thus, the employment generation ability of FDI is a matter of empirical verification, but this is currently outside the scope of this research.

In this sub-section we present data on total employment as reported by FDI manufacturing firms using data obtained from our survey. Data for total number of persons employed by firms are available for the years, 2007 and 2008. The question on total number of persons employed by FDI manufacturing firms was not restricted to employment figures at a particular point in time; hence these figures more appropriately represent average employment for the years for which information was requested. In Table 5.19 we depict basic statistical descriptions of average total employment by FDI firms for 2007 and 2008.

Table 5.19: Total Employment Statistics (FDI Manufacturing Firms)

	Total Number of Persons Employed	
Statistical Measures	**2007**	**2008**
Mean	297.67	321.75
Median	170.00	170.00
Mode	180	80
Std. Deviation	379.215	422.851
Variance	143803.814	178803.071
Skewness	2.315	2.318
Std. Error of Skewness	.289	.289
Kurtosis	4.658	4.569
Std. Error of Kurtosis	.570	.570
Minimum	18	10
Maximum	1600	1800
Number of Observations	69	69

Source: Computed from own survey

The mean for total employment is higher in 2008 than for 2007; an average of approximately 322 persons for 2008 and 298 persons for 2007, indicating the possibility that this may be due to an increase in the number of persons employed over the period. The data on total employment also demonstrate a high degree of variability judging by the high standard deviations for both years. Furthermore, if we use the mean employment figures, it can be argued that most of the firms in the survey can be classified as large-sized, where a large-sized firm is defined as one employing more than 100 persons. In the next section we describe the size distribution of FDI manufacturing firms to assess if most of them are indeed large-sized.

5.1.8 Size Distribution of Firms

The total number of persons employed by firms is used as a basis for the size categorisation of FDI manufacturing firms. As previously discussed in the methodology chapter, the following size classifications are used: Small and Medium (10–99), Large (100–250), Very Large (>250). Table 5.20 presents the distribution of firms by size categories for 2007 and 2008 based on our survey data. What clearly emerges from this data is that over 65 percent of firms can be classified as large to very large, which indicates the dominance of large-sized firms in the sample. It is important to stress that this outcome is purely random and does not reflect any bias towards large-sized firms in the selection of firms when constructing the sample for the survey.

Table 5.20: Size Categories based on Total Number of Persons Employed

Size Categories	2007		2008	
	Frequency	**Percentage**	**Frequency**	**Percentage**
Small and Medium Size	22	31.9	20	29.0
Large Size	25	36.2	26	37.7
Very Large Size	22	31.9	23	33.3
Total	**69**	**100.0**	**69**	**100.0**

Source: Author's own computations from survey responses

By comparing the size distribution of FDI firms from our survey with that from the UNIDO survey, we observe that the UNIDO survey is dominated by small- and medium-sized enterprises. Table 5.21 shows the distribution of firms by size categories based on employment data from the UNIDO 2005 survey for Ghana. We observe a greater proportion of small- and medium-sized firms relative to our survey findings; nearly 63 percent of firms from the UNIDO 2005 survey can be classified as small and medium in size, whilst approximately 16 percent and 21 percent can be classified as large and very large, respectively.

Table 5.21: Size Categories based on Total Number of Persons Employed, Manufacturing Firms (UNIDO)

Size Categories	Frequency	Valid Percent
Small and Medium	12	63.2
Large	3	15.8
Very Large	4	21.1
Total	**19**	**100.0**

Source: UNIDO FDI Survey on Ghana, 2005

We use the same size classification for employment data from Wave 5 of the RPED and GMES to investigate further evidence of the distribution of firm size among manufacturing firms in Ghana. Table 5.22 summarises distribution of manufacturing firms by size from the RPED and GMES Wave 5. We include an additional size category, *Micro Enterprises* for firms employing less than ten persons. Table 5.22 shows the dominance of micro- and small- and medium-sized firms; together the two account for nearly 78 percent of the entire sample of firms. We also observe that the proportion of large and very large firms is nearly equal in the RPED and GMES dataset. A similar pattern is observed using data on employment from the WBES. Table 5.23 presents the distribution of manufacturing firms by employment size for 2006 using data from the World Bank Enterprise survey 2007.

Table 5.22: Size Categories based on Total Number of Persons Employed, all Manufacturing, RPED/GMES Wave 5 (1997)

Size Categories	Frequency	Valid Percent
Micro	53	27.2
Small and Medium	99	50.8
Large	23	11.8
Very Large	20	10.3
Total	195	100.0

Source: RPED/GMES on Ghana, Wave 5

Table 5.23: Size Categories based on Total Number of Persons Employed, World Bank Enterprise Survey (All Manufacturing), 2006

Size Categories	Frequency	Valid Percent
Micro	138	44.1
Small and Medium	144	46.0
Large	18	5.8
Very Large	13	4.2
Total	313	100.0

Source: World Bank Enterprise Survey on Ghana, 2007`

The evidence from the UNIDO 2005 survey, World Bank Enterprise survey and the RPED and GMES clearly points to the dominance of small- and medium-sized manufacturing firms in the Ghanaian manufacturing sector. This dominance of micro- and small- and medium-sized is however not surprising. The Ghana Industrial Census conducted in 2003 showed the dominance and growth in the number of micro- and

small- and medium-sized enterprises. The census reveals that in manufacturing, 85 percent of firms can be classified as micro-enterprises, that is, firms employing less than ten persons. In fact the census reveals that 55 percent of firms in Ghana's manufacturing sector employ less than 5 persons. Further, the remaining 15 percent of firms from the census can be categorised as follows: small- and medium-sized firms (14 percent), large- and very large-sized firms (1 percent). Thus, with a very tiny percentage of manufacturing firms employing at least 100 persons, the census data show that the Ghanaian manufacturing sector is dominated by firms that can be classified as micro- and small-scale enterprises, which is also a reflection of the small-scale nature of most manufacturing activity in Ghana.

The preceding analysis on the distribution of firms by size categories creates the impression that our survey data is heavily biased towards large- and very large-sized manufacturing firms. But as stated previously, the selection of sample units in our survey was not based on any pre-stratification of the sample according to firm size. Firms were selected randomly and primarily because they were identified as FDI firms. Moreover, our emphasis, unlike the UNIDO survey, was solely to survey FDI manufacturing firms. Nonetheless, it is difficult to explain what accounts for the differences in size distribution between our survey data and the other surveys.

In spite of the differences in size categories of manufacturing firms between our survey data and data from the other surveys, a careful examination of the size distributions in Table 5.20 suggests a fairly even distribution of FDI manufacturing firms by size, bearing in mind that size was not a factor in the selection of firms for our survey data. With such a fairly even distribution of firms across the different size categories, we can compare the important aspects of FDI activity across firms based on their sizes. Whilst this can be done easily for FDI manufacturing firms using our own survey data, unfortunately, it will be impossible to undertake a direct comparison with domestic firms. But as previously indicated in the methodology chapter, this is one of the main shortcomings of this study.

5.1.9 The Exporting Behaviour of FDI Firms

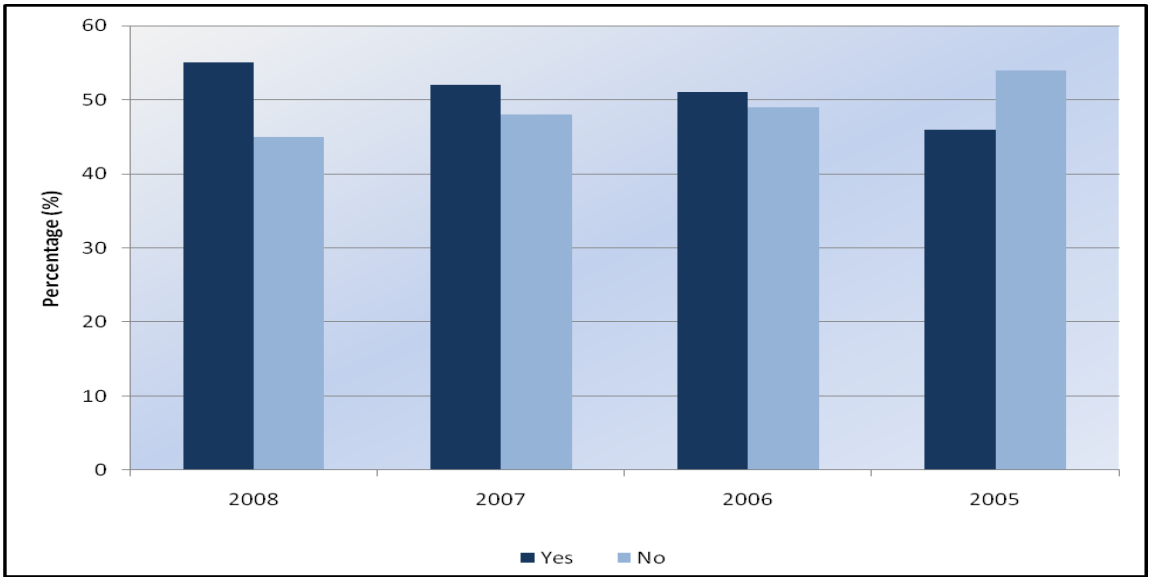
The second main objective of this research is to investigate the exporting behaviour of FDI manufacturing firms. One of the main benefits to host countries from foreign direct investment is that it brings with it knowledge and expertise on how to access foreign markets. This is because FDI possesses the managerial and technological advantages that give it superior capability vis-à-vis domestic firms in respect of access to export markets. Thus, we expect FDI manufacturing firms to be actively engaged in exporting activities. In this sub-section we present the pattern of export behaviour by FDI manufacturing firms using data from our survey.

Exporting behaviour is defined as the proportion of total sales that is exported directly by firms to other countries. Firms are classified as exporting if they directly export at least 1 percent of their total sales. Based on responses to this question, we generated a new export variable, which took the value 0 if the firm did not export and 1 if it exported at least 1 percent of total sales. Figure 5.3 illustrates the pattern of exporting behaviour by firms for the years, 2005 to 2008. Given the nature of the data available from our survey, which is cross-sectional in nature, we are unable to describe the pattern of exporting behaviour in Table 5.3 as a trend. Nevertheless, the pattern does suggest a rise in the number of firms that exported between 2005 and 2008. For example, for 2005, 46 percent of firms exported, rising to 50 percent in 2006, was 52 percent in 2007 and approximately 55 percent in 2008.[42]

It is however important to state that some firms did not begin to export until after 2006, whilst other firms were not even established before 2007. Further, during the same period some firms exited from export activity entirely. However, the number of firms entering or exiting the export business was very small, thus not significantly affecting the general impression of an increase over the period of the number of firms that exported. The analysis of entry and exit of firms in the export business will be discussed in the next chapter. Appendix A.4 presents a brief description of the exporting activities of one of the FDI firms surveyed as a case study.

[42] Analytically the approach used in defining exporting behaviour is different from that used in the UNIDO 2005 survey. In the UNIDO 2005 survey, firms were classified as exporting, only if at least 10 percent of total sales were exported. Whilst it is reasonable to envisage a situation where the proportion of firms that export in our survey will be higher than in the UNIDO 2005 survey because we use a lower threshold, increasing the threshold from 1 percent to 10 percent only results in a reduction from 55 percent to 54 percent. This clearly suggests for firms in our sample that were into exporting, the proportion of total sales directly exported was significant.

Figure 5.3: Number of Firms Engaged in Export Activity, 2005-2008



Source: Author's own computations from survey responses

5.2 Technology Transfer Activities by FDI Manufacturing Firms

The main objective of this research is to explore the extent to which FDI manufacturing firms engage in technology transfer activities. In the previous chapter we defined technology transfer for the purposes of this research to include activities by FDI firms that result in the introduction of new products, improvement in an existing product, development of a new product, improvement in an existing production process, and the introduction of new production technology, which we termed product and process technology. The other aspect of technology transfer includes the provision of training (mainly the provision of formal training) to workers, which result in the transfer of skills and technological knowledge.

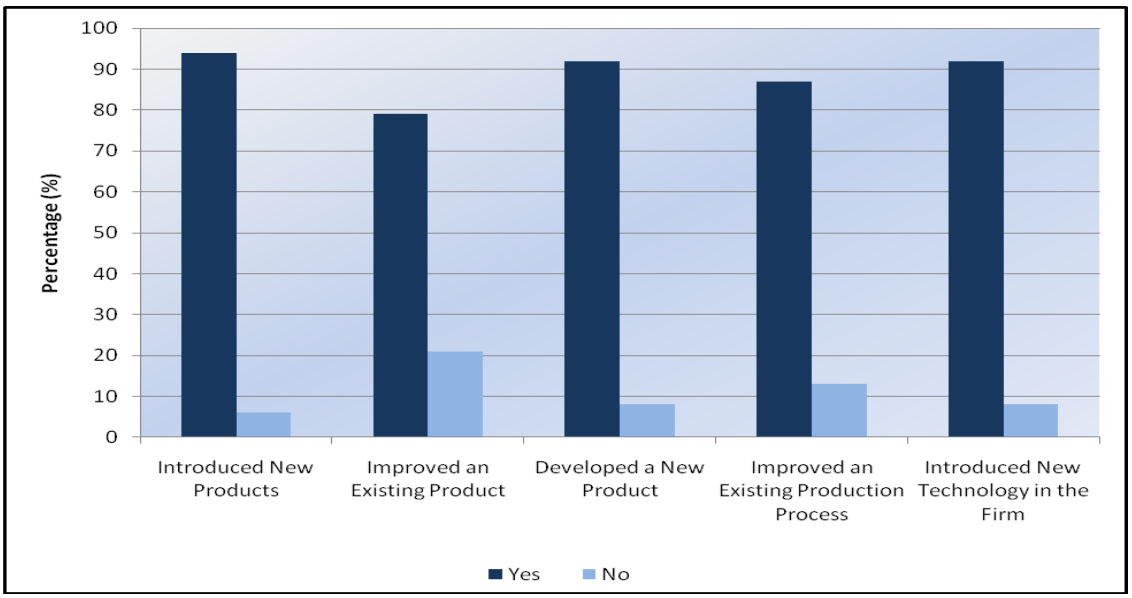
5.2.1 Activities Relating to the Transfer of Product and Process Technology

In this section we present responses to questions used to assess the extent of the transfer of product and process technology by FDI manufacturing firms, which is measured using the following indicators: introduction of a new product, improvement of an existing product, improving an existing production process, and the introduction of new technology in firm's production operations. These activities are related to several aspects of a firm's production process, and where FDI manufacturing firms

undertake these activities we consider that to constitute the transfer of technology – specifically product and process technology.

Figure 5.4 presents responses to these indicators of product and process technology transfer. The response rate to this set of questions ranged from 84 percent (improved an existing product) to 97 percent (introduced a new product). The responses show that the majority of FDI firms reported undertaking activities relating to the transfer of product and process technology; 79 percent reported improving an existing product, 87 percent reported improving an existing production process, 92 percent indicated they introduced new technology to the firm and also developed a new product, and 94 percent reported introducing a new product. The evidence therefore suggests that the majority of firms engage in at least one form of product and process technology transfer. See Appendix.A.4 for a description of the technological innovations introduced into the production process of an FDI firm surveyed as a case study Appendix A.5 also provides further information to illustrate some of the processes involved in the development of new products for the domestic market by another FDI firm surveyed as a case study.

Figure 5.4: Activities Related to the Transfer of Product and Process Technology by FDI Manufacturing Firms

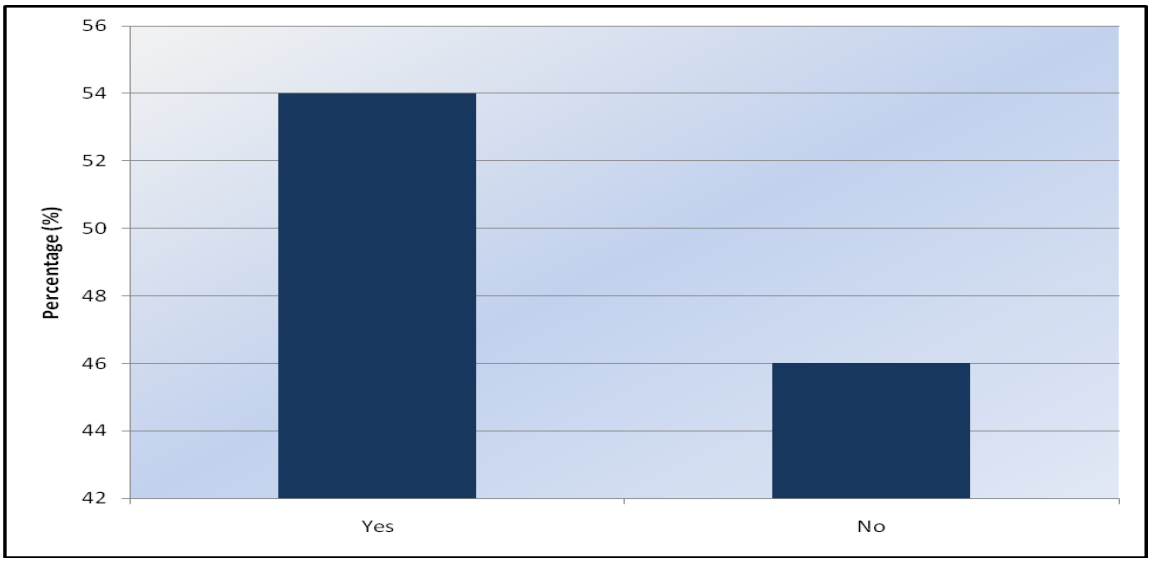


Source: Author's computation based on survey responses

5.2.2 Research and Development (R&D) Activities and Absorptive Capacity

The research and development (R&D) activities of firms are closely related to the issue of product and process technology transfer. In the literature review chapter we noted that expenditure on R&D by firms is another empirical measure of the extent of technology transfer undertaken by firms (see Keller 2004; 2009). However, because expenditure on R&D by firms is less likely to be accurate the questionnaire simply asked whether FDI firms had undertaken any R&D activities between 2008 and 2009. Figure 5.5 presents responses to the question on R&D activities by FDI manufacturing firms, which reveals that 54 percent of firms reported undertaking R&D activities during the period under consideration. See Appendix A.5 for a description of some R&D activities by one of the FDI firms surveyed as a case study.

Figure 5.5: Research and Development Activity by FDI Firms



Source: Author's computation based on survey responses

It has been argued that firms that undertake R&D activities were also more likely to have a higher absorptive capacity compared with firms that do not undertake in-house R&D activities (Li 2011; Griffith et al. 2000). We also acknowledged that in addition to R&D activities, other activities such as the training of workers build up the absorptive capacity of firms (Kim 1997; Todo and Miyamoto 2002; Blalock and Gertler 2004). The stock of human capital available in a firm has also been used in some empirical studies as a measure of absorptive capacity. Blalock and Gertler (2004) emphasise the importance of highly educated employees in the ability of firms to effectively absorb new technologies. Evidence from our survey indicate that the share of highly educated employees in total employment, measured using the following

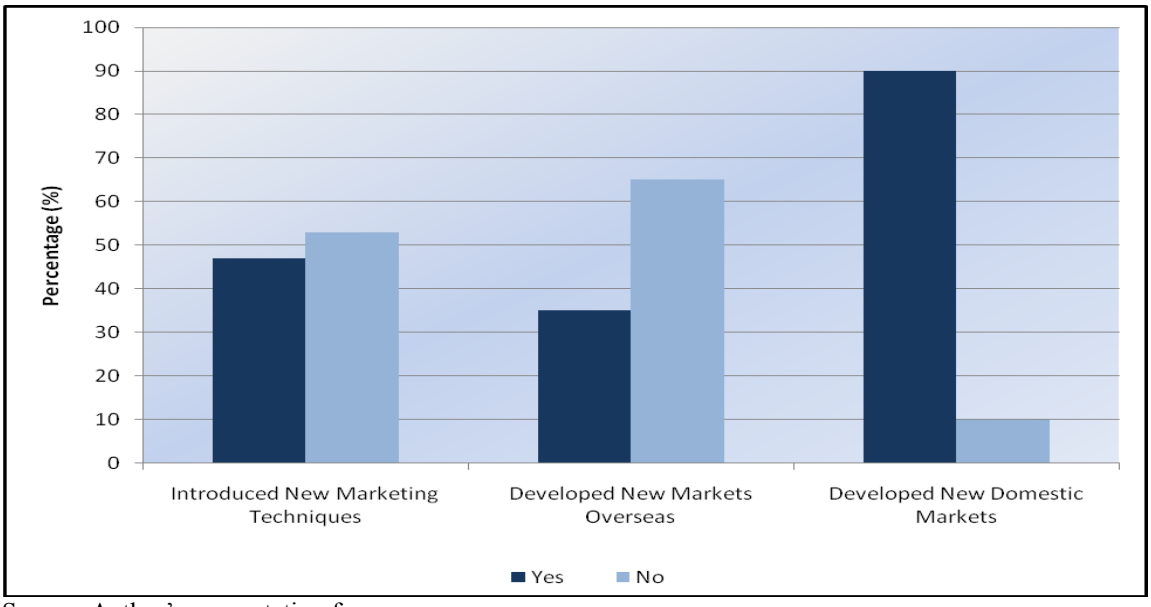
indicators - university and polytechnic graduates and university and polytechnic graduate in maths and science for both foreign and Ghanaian employees – ranges between 3 percent to 14 percent. For example, the share of foreign university and polytechnic graduates in total employment for 2008 was 5 and 3.8 percent, respectively (see Appendix Tables A.6 (a, b, c & d). The share of Ghanaian university and polytechnic graduates for the same period was 10 and 11.9 percent, respectively. It is evident that the share of highly educated workers in the total workforce is generally low. But how this affects absorptive capacity is unclear. Nevertheless, it is generally expected that the higher the share of highly educated workers in the workforce the more likely a firm is to effectively absorb new technologies.

5.2.3 The Development of Export and Domestic Markets by FDI Firms

Another aspect of FDI activity is the expectation that it possesses advantages in respect of access to overseas markets. This is important for developing countries as they attempt not just to diversify their exports but also diversify their export markets. Given the advantages that FDI possesses with regard to access to overseas markets and marketing expertise, it is expected that FDI manufacturing firms will engage in activities that involve the development of new export markets. The measures used to gauge activities involving the development of new export markets are the introduction of new marketing techniques (to exploit overseas markets), development of new market(s) overseas and development of new markets domestically.

Figure 5.6 presents responses to the questions that attempt to gauge the extent of export market development undertaken by FDI firms as well as activities relating to the development of domestic markets. The responses suggest that approximately 53 percent of FDI firms did not undertaken activities, such as introducing marketing techniques specifically aimed at exploring opportunities in overseas markets. Moreover, we find that 65 percent of firms did not undertake any activities that will result in the development of new markets overseas. It therefore suggests that the majority of FDI firms concentrated their efforts on increasing penetration in the domestic market. Approximately 90 percent of firms responded positively to the question of the development of new domestic markets. This goes to show that a significant proportion of FDI firms surveyed were marketing-seeking in nature; only a minority of firms appeared to be actively engaged in developing exports markets.

Figure 5.6: Development of Export and Domestic Markets by FDI Firms



Source: Author's computation from survey responses

5.2.4 The Transfer of Skills and Technological Knowledge by FDI Manufacturing Firms

Formal Training by FDI Firms

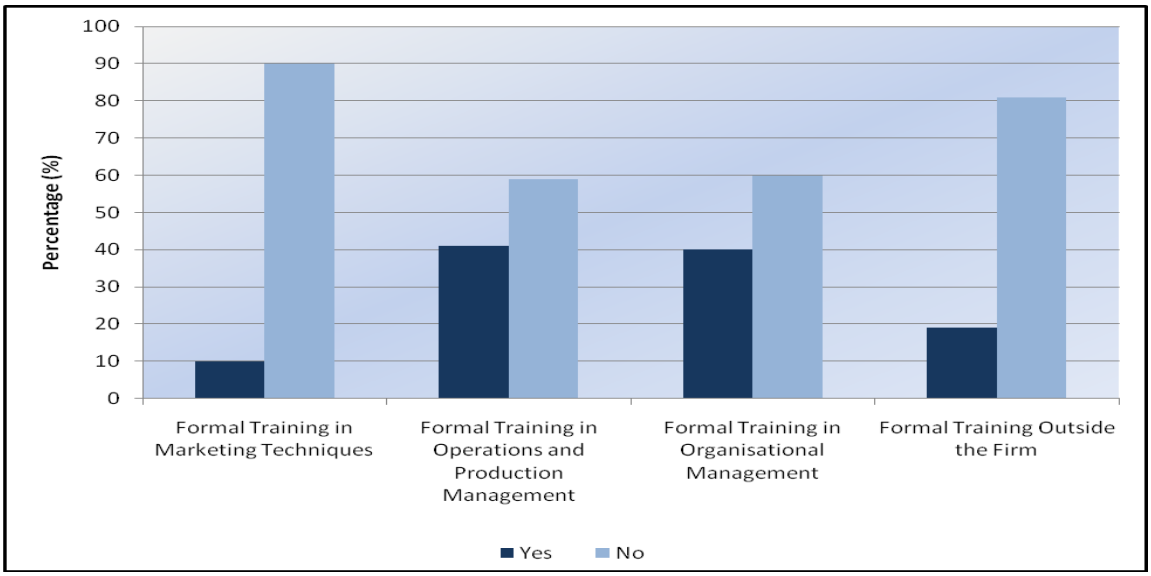
The second component of our measure of technology transfer relates to the transfer of skills and technological knowledge via the training of employees, especially via formal training schemes. The transfer of skills and knowledge has been argued as one of the benefits that accrue to a host country as a result of FDI. Whilst several transfer modes exists, we argue that the most effective mechanism for the transfer of skills and technological knowledge within firms is via the training provided to various categories of host-country workers. There are also several categories of skills and technological knowledge that can be transferred via formal training to workers and managers of firms. In this research, we have attempted to capture a few important aspects of training provided by FDI firms to local workers. Thus, in addition to the provision of formal training, other forms of informal training, such as mentoring programmes and on-the-job training have been explored.

To assess the extent of formal mechanisms for the transfer of skills and technological knowledge occurring within firms, we asked questions concerning the type of formal training programmes provided to Ghanaian workers. These questions

centred on four specific areas relating to the skills and technological knowledge content required in the production process. These are, organisational management, operations and production management, and marketing skills necessary to penetrate foreign markets, and formal training programmes outside the firm but in Ghana.

Figure 5.7 presents the responses to these measures of skills and knowledge transfer via formal training. We observe a wide variation in the extent of formal training provided to Ghanaian workers. The percentage of firms providing formal training to employees ranged from 10 percent, in the case of marketing techniques, to 41 percent, in the case of operations and productions management. The low level of formal training provided to workers on marketing techniques reinforces the point made earlier that a significant number of foreign investments are market-seeking in character, that is, not actively engaged in developing export markets.

Figure 5.7: Measures of Formal Training and Skills Transfer to Workers by FDI Firms



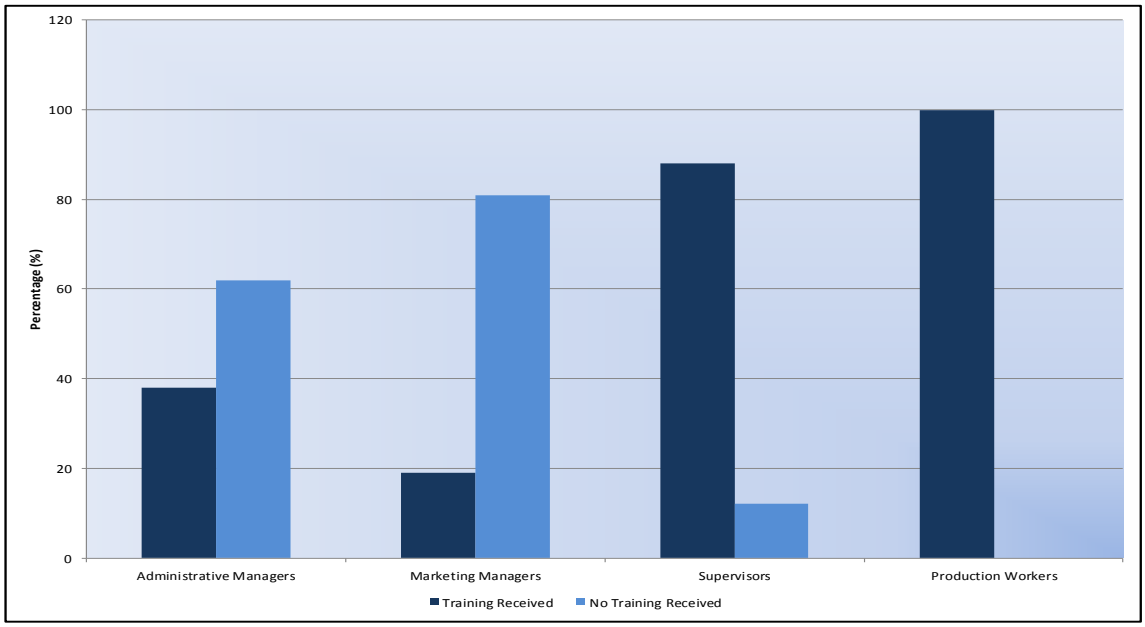
Source: Author's computation from survey responses

There was also very little formal training provision for employees outside firms. The proportion of firms providing formal training schemes for workers outside the firm was 19 percent. Our observations, judging from these responses, are that on the whole relatively fewer firms provide formal training programmes for their workers, in relation to the number of firms engaged in activities that result in the transfer of product and process technology. This therefore suggests that most FDI activity in Ghanaian manufacturing results in the transfer of product and process technology. On the other

hand, there is a relatively lower prevalence of skills and technological transfer by FDI firms.

With regard to formal training of workers, we observed that where this occurs in FDI firms, the categories of workers likely to be trained are production workers and supervisors. Figure 5.8 presents information on the various categories of workers who received formal training. Information is presented on four categories of workers; administrative managers, marketing managers, supervisors and production workers.

Figure 5.8: Categories of Workers Who Received Formal Training by FDI Firms



Source: Author's computation from survey responses

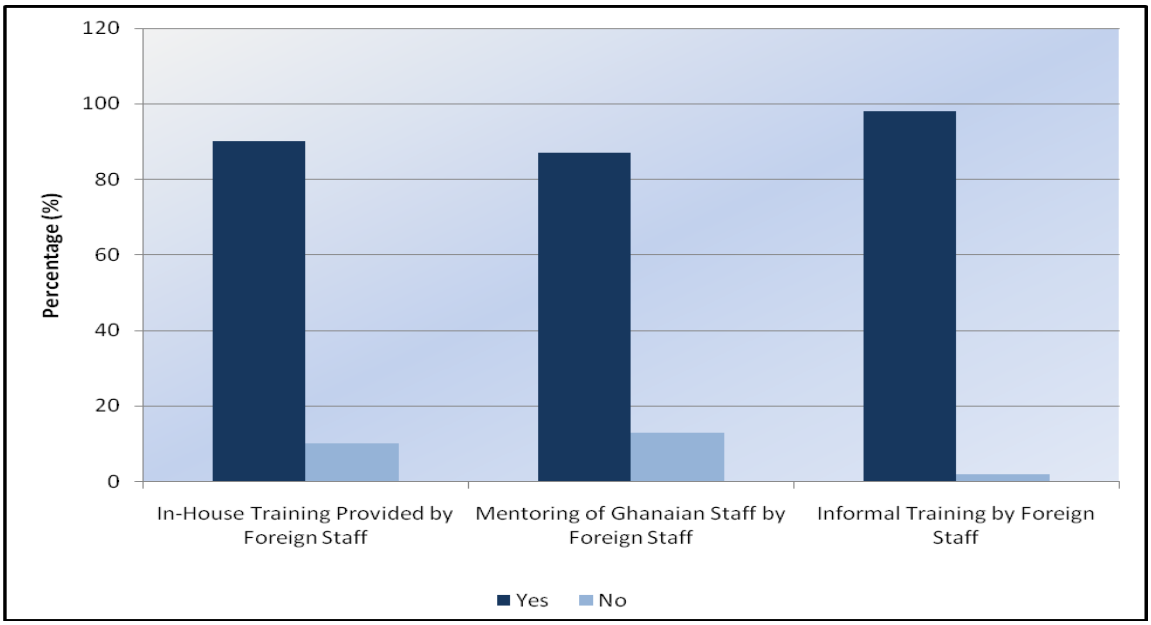
Figure 5.8 also shows that workers at senior management positions, such as administrative managers and marketing managers, were less likely to receive formal training compared with supervisors and production workers. This indicates that the transfer of skills and technological knowledge at senior management levels is very low. Among the top level of management, marketing managers were less likely to receive formal training (compared with administrative managers) in marketing techniques necessary to access foreign markets. This further strengthens our observation that a significant proportion of the FDI firms have a preference to exploit the local market as opposed to foreign markets. Workers from middle level management downwards were more likely to receive formal training, probably because they need to be trained in machine use and maintenance as well as other aspects of firms operations.

Informal Training by FDI Firms

The provision of informal training programmes by firms, such as on-the-job training, mentoring, as well as other forms of in-house training for workers, represents another way by which tacit knowledge may be transferred. However, it may be argued that these forms of informal training programmes or activities do not involve the transfer of specialised skills to workers; we might expect this to occur in situations where the production process is not very sophisticated. We also expect that informal training programmes are likely to be provided to newly recruited employees or in the event that there is a change in the production process. This is however not to suggest that no learning by workers takes place via informal training. Our main argument here is that we do not expect this form of training or learning to result in the transfer of skills and technological knowledge that is sophisticated; informal training is more likely to involve the transfer of basic skills to ensure that workers are acquainted with the production process.

Figure 5.9 presents the responses by FDI firms in respect of the provision of informal training to workers. We find that the majority of FDI firms have informal training programmes for their workers; 90 percent of firms have in-house training programmes for workers, 87 percent of firms have a mentoring scheme in place, whilst an even greater majority, 98 percent provide on-the-job training to workers.

Figure 5.9: Informal Training Provided by FDI Firms



Source: Author's computation from survey responses

In conclusion, we observe that the mechanisms by which technology transfer takes place within firms is complex and not always amenable to easy empirical assessment. Nonetheless, we devised a simple and practical approach which enabled us to assess the extent to which the transfer of technology, defined to encompass product and process technology and the transfer of skills and technological knowledge via formal training, occurs in FDI manufacturing firms.

Our findings show that whilst the majority of FDI firms engaged in activities related to the transfer of product and process technology, relatively fewer firms engaged in activities that resulted in the transfer of skills and technological knowledge. Furthermore, we find that where training occurs, production workers and supervisors were more likely to receive training compared with senior managers. This finding points to the low prevalence of the transfer of skills and technological knowledge at senior management levels; the sort of managerial expertise that FDI possess and which is expected to be transferred to host countries.

We also found that a substantial proportion of FDI firms were more market-seeking in nature than export-oriented (this is in spite of the fact that 55 percent of them indicated that they exported at least 1 percent of their sales for the year 2008; but as we will see later, the proportion of FDI firms that exported on a consistent basis between 2005 and 2008 is much lower than 50 percent).

5.3 Assessing the Performance of FDI Firms – Evaluations by Senior Managers

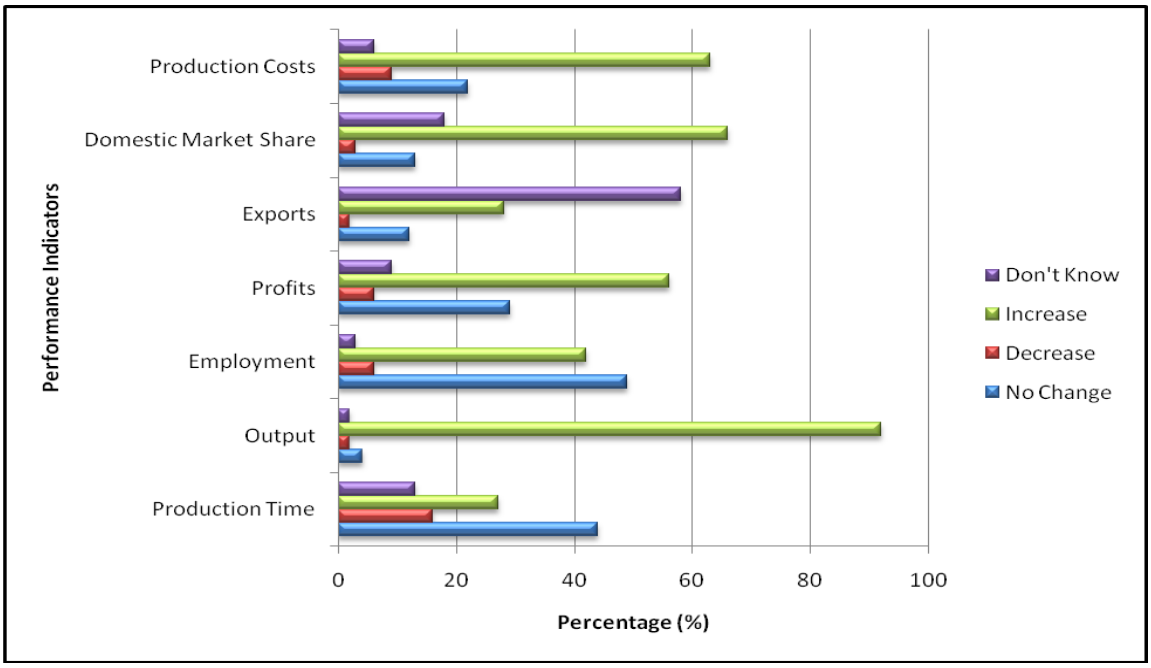
This section presents an evaluative assessment by senior managers on various aspects of their firms' operations in Ghana. Thus, the responses provided are subjective judgements provided by senior managers on the performance of FDI firms in the manufacturing sector. The period for which these performance evaluations refer to is 2008. It is also worth emphasising that the approach used in the evaluation is purely qualitative and subjective, in that no objective criteria were used to judge independently if these assessments were correct. Nonetheless, these responses provide some insight into the operations and performance of FDI firms in the manufacturing sector.

The aspects of FDI firms' operations and performance that were explored are, production costs, production time, output, employment, profits, exports, and domestic market share. Senior managers were asked to assess if in the year prior to the survey

these indicators had increased, decreased, not changed or they couldn't tell (didn't know). Figure 5.10 presents responses by senior managers based on their own assessment of the performance of their firms. The majority of managers, 92 percent reported an increase in the output. Another 66 percent reported an increase in their domestic market share, whilst 56 and 42 percent reported an increase in their firms' profits and employment, respectively. Only a few managers reported an increase in their export (28 percent), whilst 27 percent reported an increase in their production time. However, 63 percent of managers also reported an increase in their production costs.

On the other hand, relatively few managers reported a decrease in any of the performance indicators. But a substantial minority reported no change in some performance indicators. For example, 49 percent of managers reported no change in the number of workers employed, whilst 44 percent indicated no change in their production time. These responses point to a generally improved performance by FDI firms for 2008, judging by the reported increases in output, profits and domestic market share. These reported improvements in production performance were achieved in spite of reported significant rises in production costs.

Figure 5.10: Senior Managers' Evaluation of the Performance of FDI Firms



Source: Author's computation from survey responses

5.4 The Constraints Confronting FDI Firms – Evaluation by Senior Managers

In this section we present senior managers' evaluation of the constraints on their operations in Ghana. These constraints have been broadly categorised into those that affect exporting and those that affect the general operations of FDI firms. It is usually the case that many foreign investors are lured by several incentives that are afforded them by the government. The availability of these incentives does not however insure against the several challenges that face other economic agents operating in the country. These challenges range from infrastructure problems (availability of electricity, transportation problems and the use of ports) to the availability of information on export markets.

In what follows we briefly summarise the responses by senior managers on the constraints they face with regard to exporting and the general operation of the firm. The responses to these sets of questions were on assessed on the following five-level Likert-scale: strongly disagree, disagree, neutral, agree and strongly agree.

5.4.1 Constraints on Exporting Behaviour

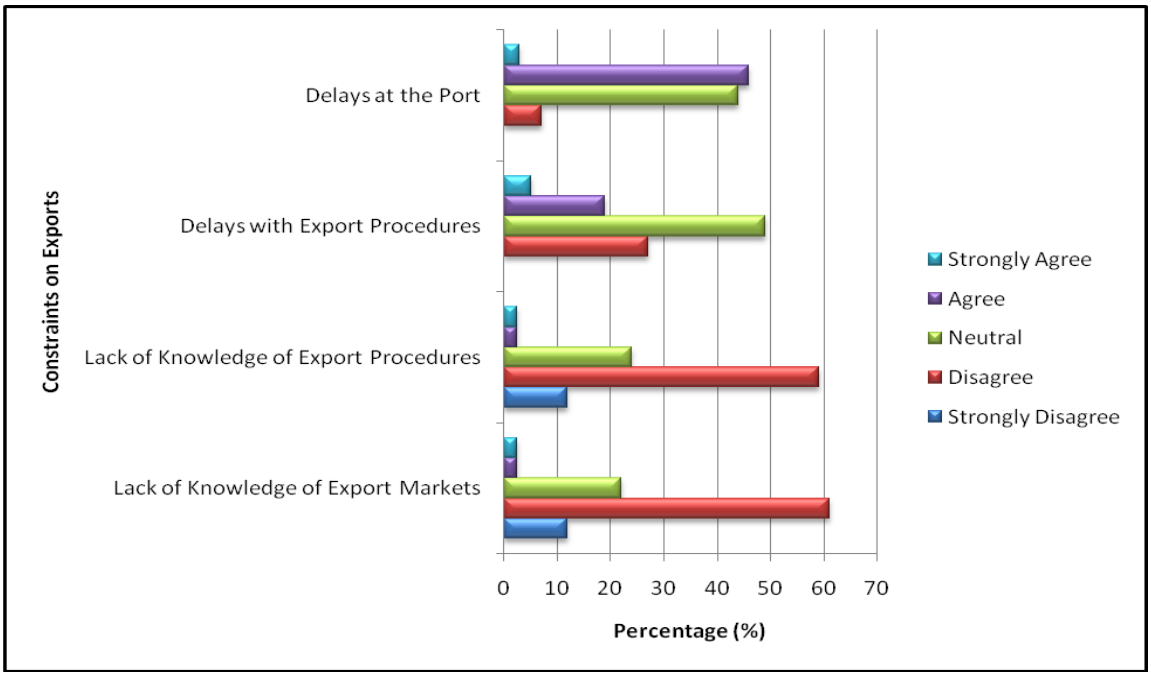
This section presents responses to questions assessing the constraints on exporting behaviour of FDI firms. The constraints on exporting behaviour were categorised as follows: knowledge of the export process, infrastructure problems, and other general problems.

5.4.1.1 Knowledge of the Export Process

The objective was to assess the extent of FDI firms' knowledge of the several processes involved in exporting and of export markets. We expect that FDI firms will face little constraints regarding knowledge of export markets. Figure 5.11 presents the responses by senior managers concerning the constraints faced in respect of knowledge of the export process.[43] Figure 5.11 shows that many firms appeared knowledgeable about the various processes involved in exporting. However, it also appears that the most important constraint was the delays encountered at the port.

[43] It is important to stress that the information presented in Figure 5.11 refers to valid responses. Of the 69 FDI manufacturing firms surveyed, 41, representing 59 percent of the total number of firms responded to these sets of questions.

Figure 5.11: Constraints with regard to Knowledge of the Export Process



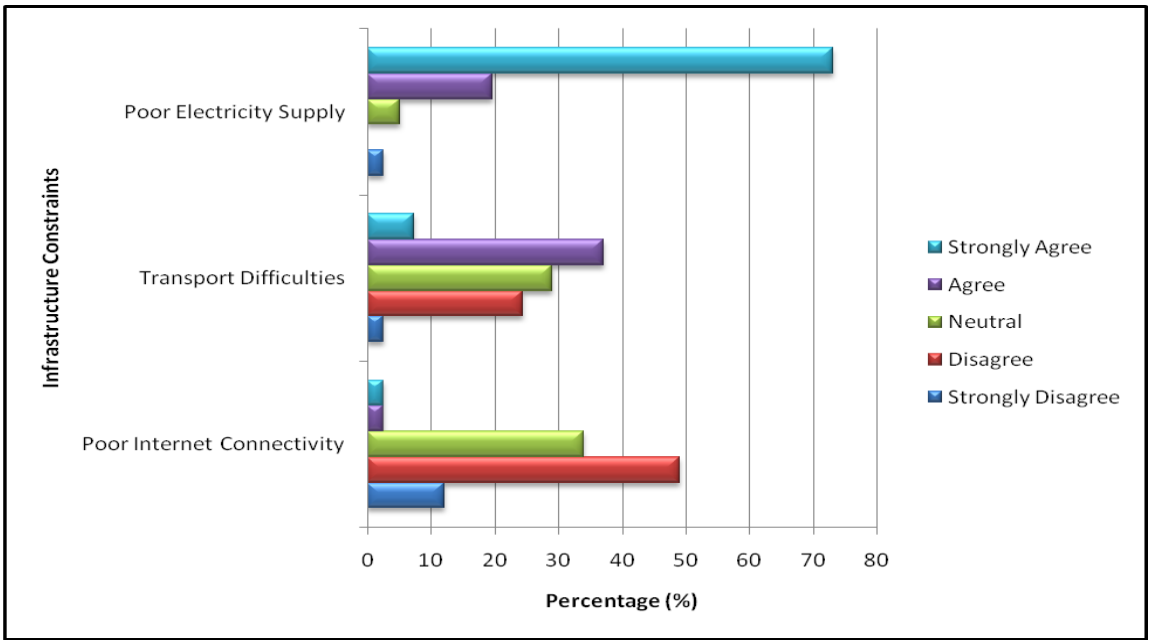
Source: Author's computation based on survey responses

5.4.1.2 Infrastructure Constraints on Exporting Behaviour

Under this section, we identify three types of infrastructure constraints. These are poor internet connectivity, transportation difficulties and poor electricity supply. Figure 5.12 present the responses by senior managers to these questions on infrastructure constraints.

The responses indicate that the most important infrastructure constraint appears to be with respect to the poor (and unreliable) electricity supply. A significant number of firms also face transportation difficulties. This is a reflection of the poor state of transport infrastructure in the country. Although the transport infrastructure has improved significantly since the mid-1980s, the state of transport infrastructure still remains a challenge to operations of businesses in Ghana.

Figure 5.12: Infrastructure Constraints on Exporting Behaviour



Source: Author's computation based on survey responses

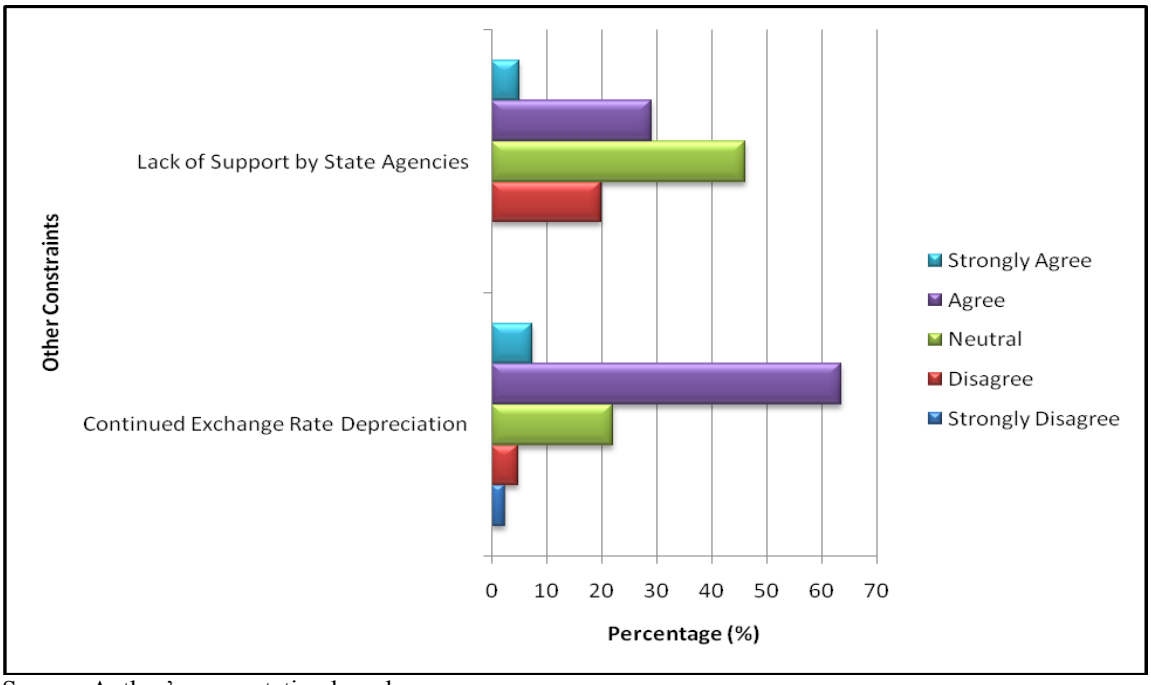
These sentiments by managers regarding the supply of electricity are not unfounded. In Ghana, electricity production is mainly undertaken by the Volta River Authority, which operates two hydroelectric power plants and two thermal generating plants. The combined generating capacity from these sources is 1,730 Mega Watts (MW), made up of 1,180MW from hydro and 550MW from thermal (VRA 2008). However, the production and supply of electricity in Ghana has been characterised by a high degree of unreliability in supply and rising costs for users over the years. These emanate from low levels of investment, occasional erratic rainfall, rising oil prices, and inefficiency in distribution. The consequence is that most manufacturing firms are compelled to rely on alternative sources, usually own-generation of power from diesel and petrol generators, to supplement the supply from the Electricity Company of Ghana. The responses are therefore not surprising.

5.4.1.3 Other General Constraints on Exporting Behaviour

In this section we present responses by managers to issues regarding other constraints faced by exporters. These are continued exchange rate depreciation and support by state agencies. We included continued exchange rate depreciation largely on account of the recent economic history of Ghana.

Ghana has experienced continued decline in the exchange rate, which also tends to feed into the inflation rate. We anticipate that many FDI firms will react differently to a continued decline in the nominal exchange rate. It is generally accepted that a relatively lower exchange rate – a weaker domestic currency – can be an incentive for exporters because it reduces the relative price of exports in international markets, all things equal. Nonetheless, a continually declining rate is also likely to become a problem for firms that use large amounts of imported inputs. A firm that imports a significant proportion of its inputs as well as machinery and equipment, would be confronted with a rising cost of production as a result of a continually depreciating currency. In addition, a constantly changing exchange rate renders long-term planning very difficult.

Figure 5.13: Other Constraints on Exporting Behaviour



Source: Author's computation based on survey responses

The second general problem is support by state agencies. Generally, we expect that foreign firms will receive a lot of assistance from state agencies charged with promoting exports, foreign direct investment and business in general. Given the presence of other constraints to exporting, general support to address the problems faced by firms is likely to ease the challenges firms face. Figure 5.13 presents the responses by managers to questions on these constraints. The responses in Figure 5.13 suggest that most managers regarded continued exchange rate depreciation of the domestic currency, the Cedi, as a major constraint on exporting. On the other hand, many firms do not consider the lack of support from state institutions as a constraint.

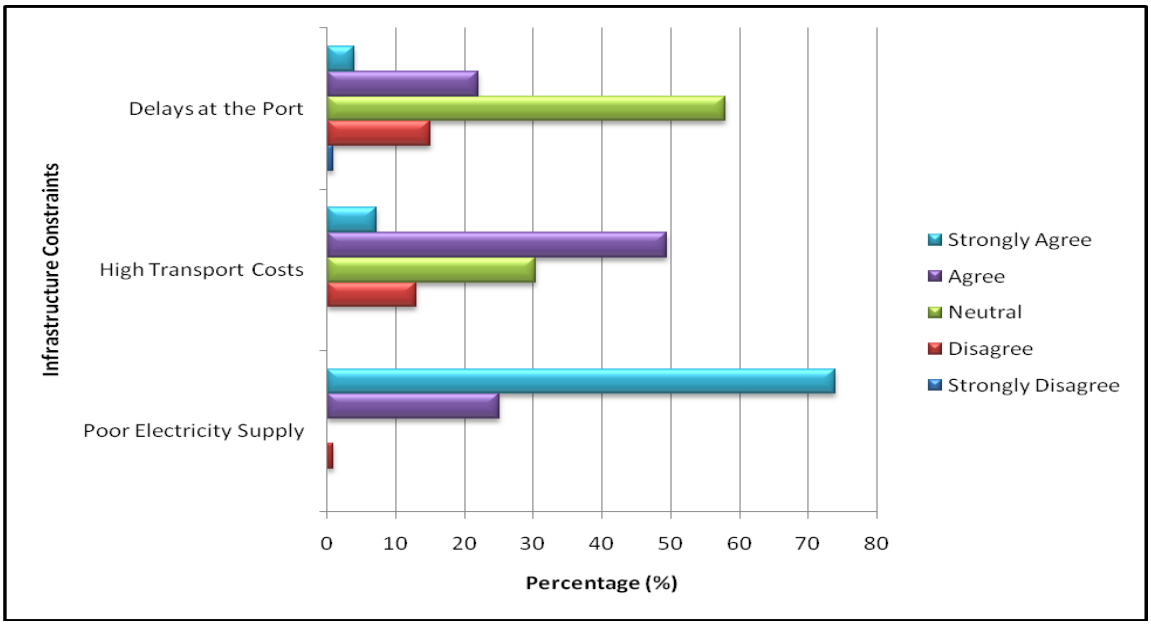
5.4.2 Constraints on Overall Firm Operations

In this section we discuss the responses by senior managers to questions on the major constraints that confront firms in their day-to-day operations. This discussion is based on responses from all the firms surveyed. The total number of responses is 69. We classify these constraints into three broad categories, infrastructure (unstable electric power supply and high transport costs), production related and other general constraints.

5.4.2.1 Infrastructure Constraints on Overall Firm Operations

Evidence from Figure 5.14 indicates that poor electricity supply is a major constraint. This observation is however not surprising as we have already noted earlier. The responses only goes to confirm a point made earlier, regarding the state of electricity production and distribution in Ghana, which is not different across much of SSA. The low levels of investment means this problem is unlikely to be resolved in the near future. Another major constraint appears to be related to transportation, specifically the costs of transportation. High transport costs generally feed into the production costs of firms, thus potentially reducing their competitiveness.

Figure 5.14: Infrastructure Constraints on Firm Operations



Source: Author's computation based on survey responses

5.4.2.2 Production Constraints on Firm Operations

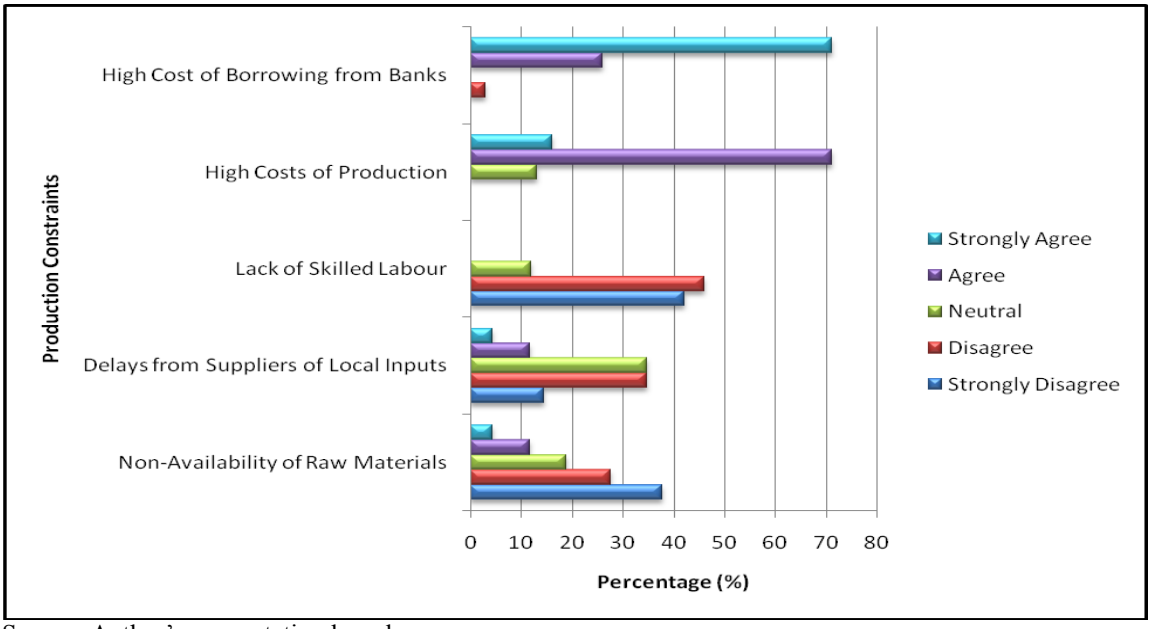
Figure 5.15 presents responses by senior managers on production constraints that confront the overall operations of their firms. Production constraints consist of the following: non-availability of raw materials, delays from suppliers of local inputs, lack of skilled labour, high costs of production, and high borrowing costs from commercial banks.

Figure 5.15 suggests that the non-availability of raw materials, delays by suppliers of local inputs and lack of skilled labour do not represent a significant constraint on FDI firms. Most senior managers did not consider these issues as constraints to their operations. That many of the firms did not find skilled labour to be a constraining factor is largely because there is a large fairly well-educated workforce in Ghana, many of whom are unemployed. Again, the kind of manufacturing activities in which many of these firms engage are not in the high-tech sectors, which require a very highly skilled workforce.

However, the majority regarded high costs of borrowing from the commercial banks and high costs of production (which may be due to several of the other constraints previously mentioned) as the most prominent constraints facing their

operations in Ghana. It is not surprising that many managers regard the high cost of production as a serious constraint on their operations.

Figure 5.15: Production Constraints to Firm Operations



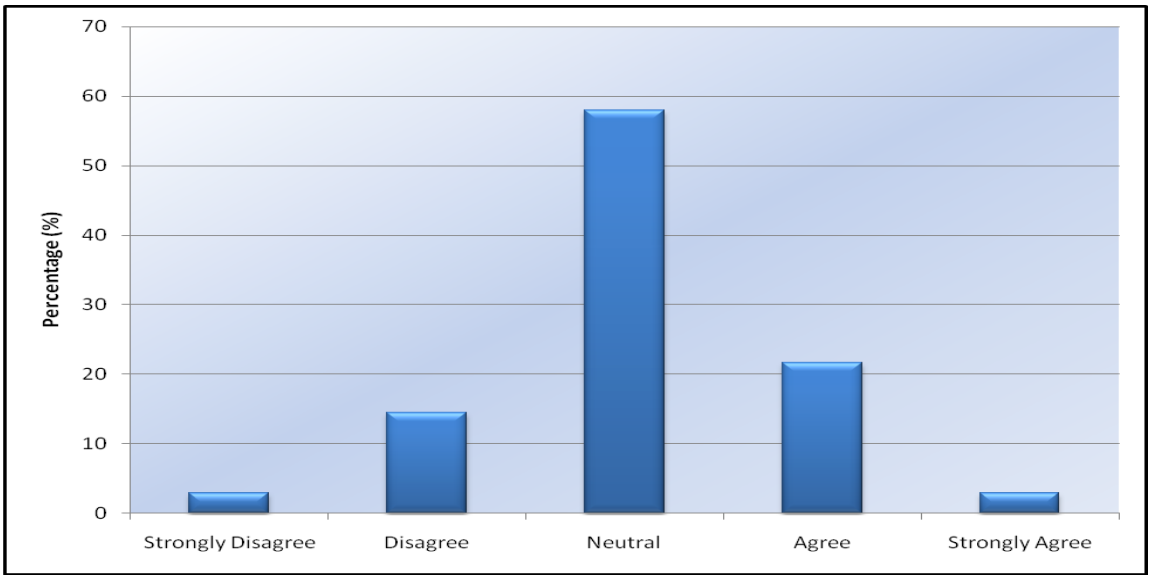
Source: Author's computation based on survey responses

As we will see below inflation represents one of the big problems faced by firms in Ghana. The other is the high cost of borrowing from commercial banks. Lending rates by commercial banks in Ghana are relatively high. The average lending rate of commercial banks is in excess of 20 percent. For example, the average lending rate to the manufacturing sector was 24.6 percent between January 2007 and December 2008. However this increased to an average rate of approximately 31 percent for the period January 2009 to December 2010 (Bank of Ghana, 2011). These costs eventually feed into production costs, thus raising the general cost of production, which affects the competitiveness of manufacturing firms, especially when they have to compete with imports from China and other emerging economies.

5.4.2.3 Other General Constraints on Firm Operations

We define other general constraints to include delays that arise when dealing with government institutions, and other constraints identified by FDI firms during the survey. Figure 5.16 shows that many firms do not regard delays with government bureaucracy as a constraint.

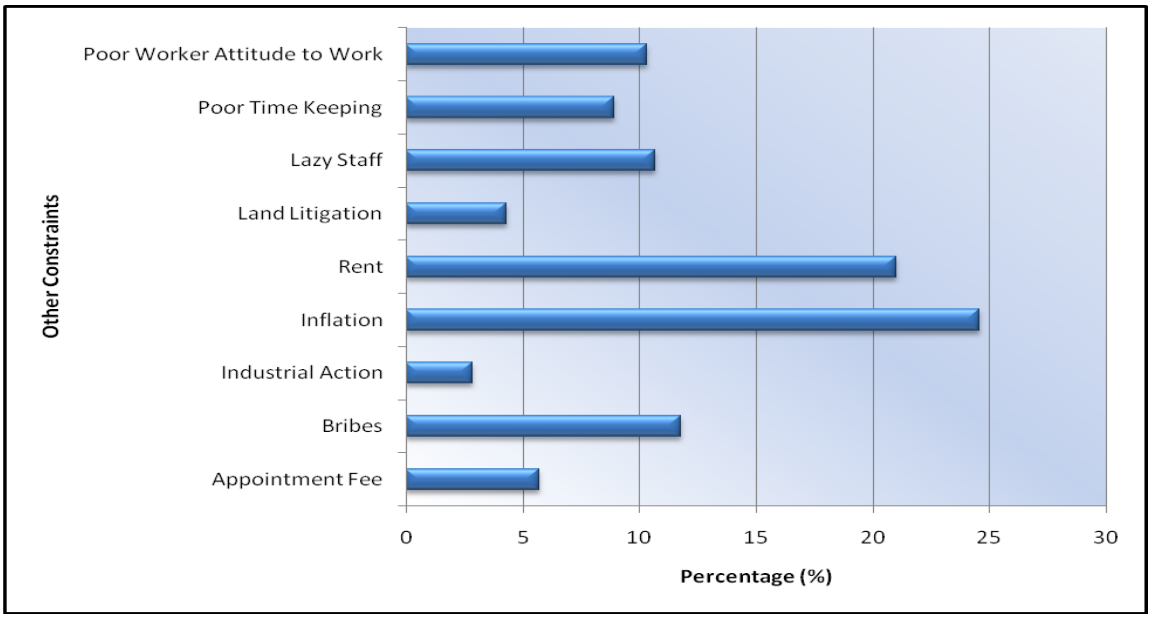
Figure 5.16: Delays from Government Bureaucracy



Source: Author's computation based on survey responses

Figure 5.17 presents responses by senior managers on other constraints they identified as impeding their operations. The responses in Figure 5.17 are derived from multiple responses provided. In total 281 responses were identified, hence these percentages presented (in Figure 5.17) represent a proportion of this total. The responses suggest that inflation represented their biggest concern (approximately 25 percent), followed by rent paid to owners of property (21 percent). For example, with regard to inflation, the year-on-year inflation rate rose from 10.1 percent in July 2007 to 12.75 percent by December 2007. By April 2008 the inflation rate was 15.3 percent, rising to 18.31 percent by July 2008. Other important constraints identified includes, bribes (11.7 percent), lazy staff (10.7 percent) and poor worker attitude (10.3 percent). Senior managers also identified poor time keeping by state officials and other business persons, the payment of appointment fees to an intermediary in order to secure an appointment with an 'important' person in a government institution or quasi-government agency, land litigation and industrial action by workers as other constraints confronting their overall operations.

Figure 5.17: Other Constraints Identified by Managers



Source: Author's computation based on survey responses

5.5 Summary and Conclusion

In this chapter, we presented the basic characteristics and attributes of FDI firms in the manufacturing sector. The data used were obtained from a survey conducted in the last half of 2009. We find that most FDI projects originate from China, followed by India, displacing traditional sources of FDI to Ghana such as the United Kingdom. Firms are more likely to locate in the Greater Accra region than elsewhere in Ghana. The majority of FDI firms can be found in the Food and Beverages, and Chemicals and Plastics industries. We also found that most of the firms, especially those originating from Europe are large or very large, and are located in the Food and Beverages industry. Indian FDI firms are more likely to be located in Chemical and Plastic industry, whilst Chinese FDI firms, usually small and medium in size are located in the Textiles and Leather industry.

With regard to the transfer of technology we find that most FDI activity involves the transfer of product and process technology. On the other hand, relatively fewer FDI firms were engaged in activities that results in the transfer of skills and technological knowledge via formal training to workers. And where training occurs, production workers and supervisors were more likely to receive training compared with

senior managers. Although the many FDI firms are likely to be export-oriented, a significant number appear to be market-seeking in nature and thus concentrate their energies on improving their domestic market share.

An important finding to emphasise is that not all FDI activity in Ghana involves the transfer of technology. This is in spite of the majority of firms undertaking activities that involve the transfer of product and process technology. However, a significant number, approximately 45 percent of the firms surveyed, did not engage in R&D activity or provide training that leads to the transfer of skills and technological knowledge.

In spite of the incentives provided to FDI firms to invest in Ghana, an assessment of the business environment suggests that FDI firms are not entirely immune from the challenging economic environment which confronts domestic firms. The business environment is fraught with problems such as poorly developed transport infrastructure and unstable power supply. In addition, firms perceive themselves confronted with rising costs of borrowing, inflation, high rents, poor worker attitude and lazy staff.[44]

[44] During the survey we were unable to interview any workers.

Chapter 6

On the Benefits of FDI – Assessing the Extent of Technology Transfer and Export Behaviour using Evidence from Firm Surveys

6.0 Introduction

The development of most technological capability in developing countries in one way or another starts with and builds on transfers - of various kinds, including spillovers - of technology from technologically more advanced countries (Evenson and Westphal, 1995). For many developing countries foreign direct investment presents the most convenient and easiest means by which international technology transfer can occur, although other channels for transfer exist. The emphasis on foreign direct investment is largely on account of increased interest among academics and policy practitioners on the potential benefits of foreign direct investment for host countries. We have already noted that most of the empirical literature on foreign direct investment has witnessed a growing interest in the potential spillover effects of FDI on domestic firms.

However, these empirical studies on spillovers assume that FDI naturally involves the transfer of technology, and therefore domestic firms may potentially benefit. Moreover, it assumes that the technologies that are transferred are *public goods* in character, which is then freely available to domestic firms. With these presumptions, these empirical studies have gone on to assess the spillover effects on domestic firms. But we have argued earlier that this assumption is unsatisfactory and thus requires an assessment of whether FDI is associated with the transfer of technology to host countries.

In Chapter 5 we presented evidence on the extent of international transfer of technology undertaken by FDI manufacturing firms in Ghana. We found that the activities of most FDI firms involved the transfer of product and process technology. On the other hand, relatively few FDI firms were engaged in activities relating to the transfer of skills and technological knowledge via training. We also examined the characteristics of FDI firms using information obtained from our own survey data in Chapter 5, and where data availability and comparability permitted we compared some of the characteristics of FDI firms with that for other manufacturing firms using data from the RPED and GMES, UNIDO 2005 and the World Bank Enterprise surveys on Ghana. We found that with the exception of a few firm characteristics, the FDI firms from our survey have similar characteristics to that of other (domestic) manufacturing firms in Ghana. In this chapter we set out to address the two main hypotheses of this research; these hypotheses are restated again in Box 6.0 for convenience.

Box 6.0: Research Hypotheses

Hypothesis 1: There is no difference between FDI firms and domestic firms in respect of technological activities.

Hypothesis 2: There is no difference between FDI firms and domestic firms in respect of exporting behaviour.

The objective behind the first hypothesis is to assess whether the activities of FDI firms related to the transfer of technology are significantly different from technological activities of domestic firms.[45] The second hypothesis, which examines whether FDI firms are more export-oriented than domestic firms, is derived from the generally held opinion on the potential benefits FDI brings to host countries. As Blomström (1990: 5) observes many developing countries now actively encourage multinationals to invest in their economies, especially in the manufacturing sector; the 'central reason is the need to expand exports'. This is because multinationals 'are thought to carry potential advantages in entering world markets, such as experience and knowledge in international marketing'. Consequently, we will expect that FDI firms would be more likely to export compared with domestic firms. These hypotheses are tested by comparing the relevant proportions for samples of FDI and domestic firms in

[45] Technological activities will be described in the next section.

respect of the issues being investigated. To achieve this we use a combination of own survey data and data from the RPED and GMES and World Bank Enterprise survey.

Our empirical approach, by focusing on assessing the extent of technology transfer within FDI firms is unusual; most empirical research on FDI and technology transfer have focused on the spillovers to domestic firms due to the presence of foreign firms in an industry. However, in the case of Ghana we are not convinced the data from the various surveys on manufacturing activity in Ghana can sufficiently address this question of technology transfer and productivity spillovers. The RPED and GMES data, which are probably the most comprehensive on the manufacturing sector, have too few foreign firms (defined by proportion of foreign ownership in equity) in the sample.[46] That is, the number of firms that can be described as foreign within the dataset is too small. Thus, we expect a limited degree of interaction between foreign firms and domestic firms, which is unlikely to result in significant spillover benefits to domestic firms.

Furthermore, data from the RPED and GMES reveal very little learning by domestic firms from foreign firms, and very little training provided to workers (see Appendix Table A.7 and Appendix Figures A.2 – A.6). There is also no formal training provision by foreign firms to their workers to suggest any formal mechanisms by which technology spillovers via worker mobility can be explored. It is these criticisms and the shortcomings of the existing datasets that inform one of the main objectives of this research, that is, to find out whether foreign investment necessarily involves technology transfer.

As already noted, one of the main difficulties in empirical studies on technology transfer is its measurement. The challenge of having an appropriate definition aside, the tacit nature of technology also implies a difficulty in measuring it directly. Despite the problems with the measurement of technology, Hall (2011), Keller (2004, 2009) and Kokko and Blomström (1995) note the existence of several indirect measures, such as expenditure on R&D, patent count, higher productivity, capital expenditures related to the introduction of new processes, marketing expenditures related to new products, education and training of employees, technical documentation, exchanges of technical

[46] We use the term foreign firms to describe those manufacturing firms in the other survey data with significant foreign participation (where significant foreign participation is defined to mean at least 10 percent of equity in the manufacturing firm). Otherwise we use ownership characteristics to define foreign firms. Thus, foreign firms are distinct from FDI firms, which we use to describe the manufacturing firms from our own survey.

personnel, payments for royalties, licences and imports of machinery and equipment, and expenditures on design and technical specification.[47]

In this research we have grappled with the difficulty of defining what exactly constitutes an appropriate measure of technology transfer by FDI firms. This is primarily due to the absence of surveys that assesses the innovative activities by firms in Ghana, and the paucity of information on indirect measures of technology transfer such as R&D spending by firms in existing surveys. Indeed, where such questions have been asked, such as in the UNIDO 2005 survey, the responses to the questions have been very low, and where firms have responded the amounts of money reported to be spent on R&D have been low. Given these problems in empirically assessing the extent of technology transfer by FDI firms, we decided to use a combination of the non-R&D measures to assess the extent of product and process technology transfer, and the provision of formal training to workers to assess the extent of the transfer of skills and technological knowledge by FDI firms in the manufacturing sector; these were presented in Chapter 5.

Further, we noted that the differences between the characteristics of FDI and domestic firms in the manufacturing sector are not substantial, thus making it possible for us to compare both groups of manufacturing firms with respect to their technological activities and exporting behaviour. This approach of comparing the two groups – what we term quasi-comparison of proportions – uses data drawn from our survey data and from the RPED and GMES and the WBES. The groups are then compared in respect of their technology-related activities and exporting behaviour.

It is worth emphasising the main reasons why we chose to compare FDI and domestic firms using the quasi-comparison of proportions method. Firstly, we noted in the methodology chapter that a direct comparison between FDI and domestic firms cannot be satisfactorily done because our survey data do not allow us to quantitatively address this issue; the data obtained from our survey were only for FDI firms. We are also unable to rely solely on existing datasets because, as we will see later, the number of foreign firms in the other survey datasets is too few to be used satisfactorily for these purposes. Further, in the RPED and GMES and WBES the concept of technology was

[47] Expenditures on R&D are generally considered as inputs in the innovative process, whilst patent counts are regarded as the output in the innovative process. Higher productivity is a manifestation of the effects of technology transfer. For further discussion of the problems in using any of these measures, see (Keller 2004; Hall 2011).

not adequately measured and neither was there any attempt to assess the extent of technology transfer.

Secondly, it is important to emphasise that this quasi-comparison between FDI firms and domestic firms and the conclusions made can only be treated with caution. This is because the different datasets were obtained from surveys with different objectives, coverage and time periods. For example, the RPED and GMES dataset is longitudinal, whilst the UNIDO dataset, the World Bank Enterprise survey dataset, and the dataset from our own survey are cross-sectional. Hence, it is also impossible to combine fully all the datasets given that the scope and objectives of each of the surveys are different. In terms of time period, the RPED and GMES dataset refers to information available for 1997.[48] However, the WBES has data that are relatively recent; information is available for 2006. Consequently, the quasi-comparison between FDI and domestic firms will use data from our survey and that from the World Bank Enterprise survey.

In the subsequent sections we examine the differences between FDI and domestic manufacturing firms in the following areas of their operations; technology-related activities, the provision of formal training to workers to assess the extent of skills and technological knowledge transfer, and exporting behaviour.

6.1 Technology-related Activities of FDI and Domestic Manufacturing Firms

In this section we examine the technology-related activities of FDI and domestic manufacturing firms, with the objective of establishing if there are any differences between the two groups. We have previously discussed the activities of FDI firms related to the transfer of technology. We used two measures to assess the extent of technology transfer; these were transfer of product and process technology and the transfer of skills and technological knowledge.

However, with regard to our definition of technology transfer, it is difficult to conceptualise how domestic manufacturing firms may be involved in the transfer of technology. Consequently, we have decided to use the term technological activities to describe the activities by domestic firms that result in technological improvements in

[48] We are however aware that the most recent data is up to 2002 although the new data have only recently become publicly available.

the production process. These activities will be defined to include all acquisitions of (new and usually foreign produced) plant and machinery to improve any aspect of the production process, the use of foreign licences in production, the provision of formal training to workers, which could be carried out by expatriate staff, as well as other forms of learning. These measures identified are by no means exhaustive, as they do not cover conceptually all aspects of the technological activities by manufacturing firms.

Moreover, it is generally the case that the mechanism by which technology and knowledge transfer takes place within firms can be described as a black box, because it involves a series of complex processes, such as the interactions between several layers of workers and management, various activities and programmes designed to ensure skills upgrading, productivity improvements, product innovations, and market development, much of which is not always directly observable by researchers. Thus, to assess the technological activities of firms, we rely on indirect measures.

In comparing the activities of FDI firms and domestic firms in their technological activities, we recognise that we are comparing two slightly dissimilar activities; technology transfer and technological activities. However, given that both involve activities leading to improvements in the production process and the impartation of skills and knowledge we believe a quasi-comparison of the groups will shed some light on the possible differences between FDI and domestic firms in respect of technology-related activities.

We first discuss technology transfer activities of FDI firms, and proceed to discuss the technological activities of domestic firms using data from the RPED and GMES and World Bank Enterprise survey, before comparing the two groups in respect of technological activities.

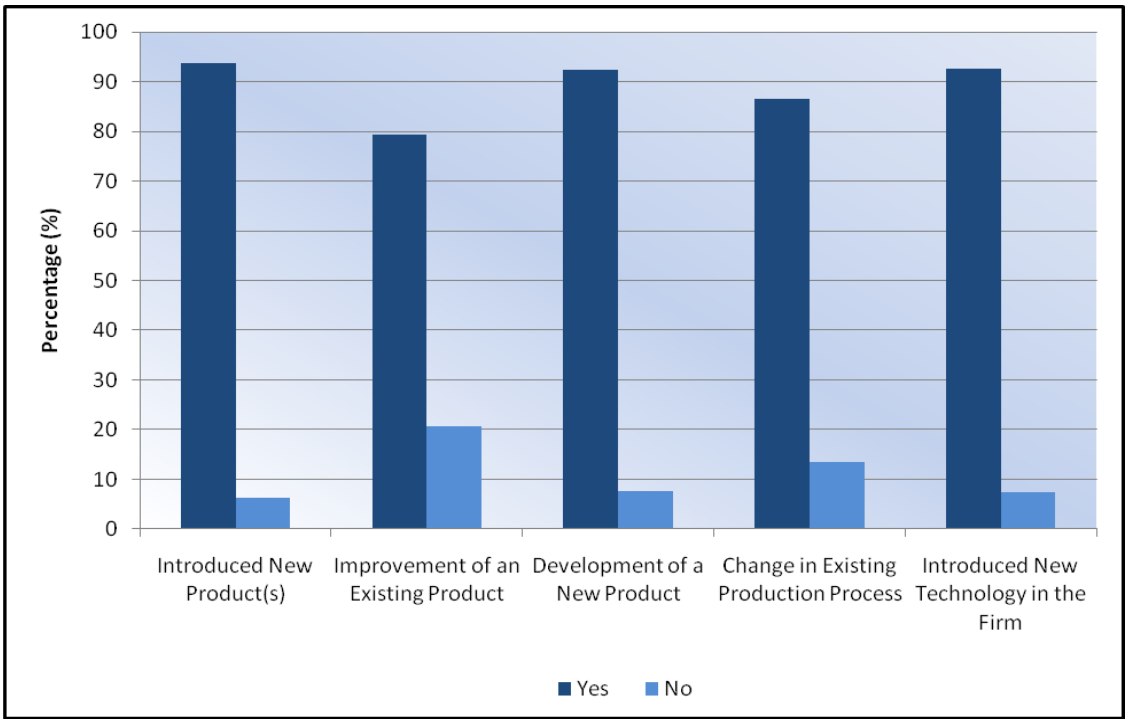
6.1.1 Technology Transfer by FDI Firms (Own Survey)

In chapter 5 we discussed the technology transfer activities of FDI manufacturing firms. Using two measures of technology transfer – product and process technology and skills and technological knowledge – we observed that most firms undertook activities related to the transfer of product and process technology, whilst relatively few firms undertook activities related to the transfer of skills and

technological knowledge. We also argued that if FDI firms engaged in these non-R&D activities, then this must necessarily indicate the transfer of product and process technology. Figure 6.1 reproduces the responses by FDI firms to these measures for product and process technology transfer.

Based on the responses in Figure 6.1 we created a proxy measure, which provides an estimate of the transfer of product and process technology by FDI firms. Using a rather strict definition, this proxy takes the value of one (1) if a firm responded 'yes' to the each of these questions, and zero (0) if at least one response was 'no'. In constructing this proxy measure for product and process technology transfer, we are aware of the potential loss of information from the individual responses in Figure 6.1. However, as already state this is only to provide an estimate of the extent of product and process technology transfer by FDI firms.

Figure 6.1: Activities Related to the Transfer of Product and Process Technology by FDI Manufacturing Firms



Source: Author's computation based on survey responses

The proxy measure to estimate the pattern of FDI firms' activities with regard to the transfer of product and process technology shows that approximately 57 percent of FDI firms can be described as *intensively* engaged in the transfer of product and

process technology.[49] If we limit the definition of product and process technology transfer to only those questions which relate to production technology in the firm (introduction of new technology; changed an existing production process; improved an existing product) in creating the proxy measure, the number of FDI firms engaged in the transfer of product and process technology rises only marginally to approximately 58 percent. Hence, despite the strict conditions underlying this proxy measure for technology transfer by FDI firms, we believe it adequately estimates the extent of technology transfer by FDI firms from our survey. The important finding is that not all FDI activity in the manufacturing sector involves the transfer of technology.

In the next two sections, we discuss the technological activities of domestic and foreign firms using data from the RPED and GMES and World Bank Enterprise survey. In the RPED and GMES, technological activities are assessed using information on responses provided by manufacturing firms to questions relating to the intended uses of equipment. In the World Bank Enterprise survey this measure is based on the use of foreign licences in production.

6.1.2 Technological Activities by Manufacturing Firms – Wave 5 RPED/GMES

In this section we explore the extent to which manufacturing firms are engaged in technological activities. In the fifth round of the RPED and GMES firms were asked questions on various aspects of their operations for the period 1996 and 1997.[50] We extrapolate information on the technological activities by firms based on responses to the question on equipment acquisition and the purpose to which these acquisitions will be put.

We have seen that one means by which firms can acquire technology is through the acquisition of intermediate inputs and equipment, especially the import of equipment from advanced countries (Grossman and Helpman 1997; Coe and Helpman 1995; Keller 1998). Besides, Navaretti et al. (2000) note that *new* and *used* machinery can differ in three important respects. These are the risk of breakdown, productivity of embodied technology, and the required technical skills. Thus, it follows from these

[49] This figure contrasts with the 93 percent of firms who reported introducing new technology into their operations, 87 percent who reported changing an existing production process, 79 percent reporting improving an existing product, 94 percent who introduced new products, and 92 percent who developed a new product in the course of their production years.
[50] In some instances firms were asked to provide answers for pre-1996.

distinctions, that new machinery will embody modern technology relative to used machinery, and thus require a higher level of workers' skill to operate. Hence, we expect that the technology embodied in new equipment will result in the acquisition of new skills by workers who have to work with these equipment.

The questions on the acquisition and use of equipment by firms are obtained from the Investment Section of the main questionnaire for the RPED and GMES. On investment spending, firms are asked how much they invested on land, buildings and plant and equipment in 1996 and 1997. However, as argued above, plant and equipment represents the most probable means among these investment expenditures by which firms can acquire technology. But we must emphasise that there is no information on level of technological sophistication embodied; whether low-tech or high-tech. In addition to the question on investment spending, a series of further questions with set responses are asked regarding plant and equipment in particular. These are detailed in Box 6.1.

Box 6.1: Questions and Set Responses on Investment in Equipment

Q. What was the purpose of the investment in equipment?

Set responses: Add to capacity; Replace old equipment; Improve productivity; Improve quality of output; and Produce a new output.

Q. Was the equipment...?

Set responses: New; Used; or Mixed.

Q. Was the equipment...?

Set responses: Imported; Foreign made, bought locally; or Made locally.

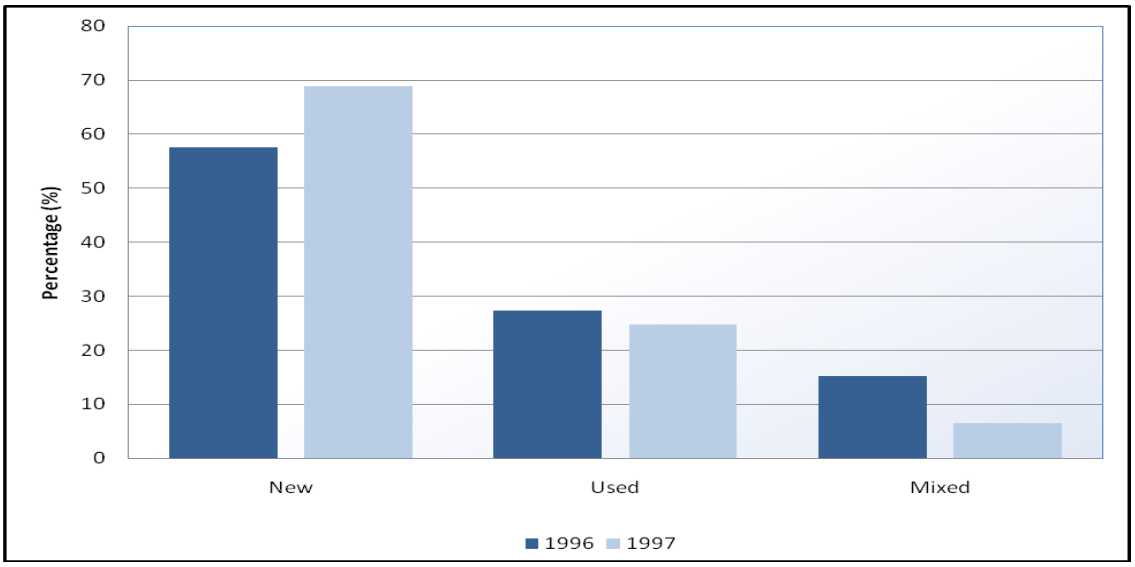
Source: RPED/GMES Wave 5, Main Questionnaire

From these questions we tease out the extent to which firms' investment activity on equipment can be described as technology-related. First we examine the spending on plant and equipment in 1996 and 1997. There were 195 firms surveyed during Wave 5 of the RPED and GMES. However, approximately 34 and 48 percent of firms provided information on expenditure on plant and equipment for 1996 and 1997, respectively. The average spending on plant and equipment by firms was 115 million Cedis, approximately $65,500, whilst the average spending for 1997 was 435 million Cedis,

approximately $191,000.[51] Between the two years, there was nearly a threefold increase in the average spending by firms on plant and equipment in nominal terms. But this increase could be purely due to the difference in sample sizes in terms of valid responses to the question between 1996 and 1997, inflation and/or exchange rate depreciation.

Beyond the actual spending by firms on plant and equipment, we also explore whether the plant and equipment acquired was new, used or mixed (that is, a combination of new and used). The status of plant and equipment acquired by firms is depicted in Figure 6.2. For 1997, 47.7 percent of those surveyed provided responses to this question, whilst 33.8 provided responses for 1996. In both years, 1996 and 1997, the majority of firms, approximately 58 percent and 69 percent, respectively, acquired new equipment.

Figure 6.2: Status of Equipment Acquired by Manufacturing Firms, 1996 and 1997



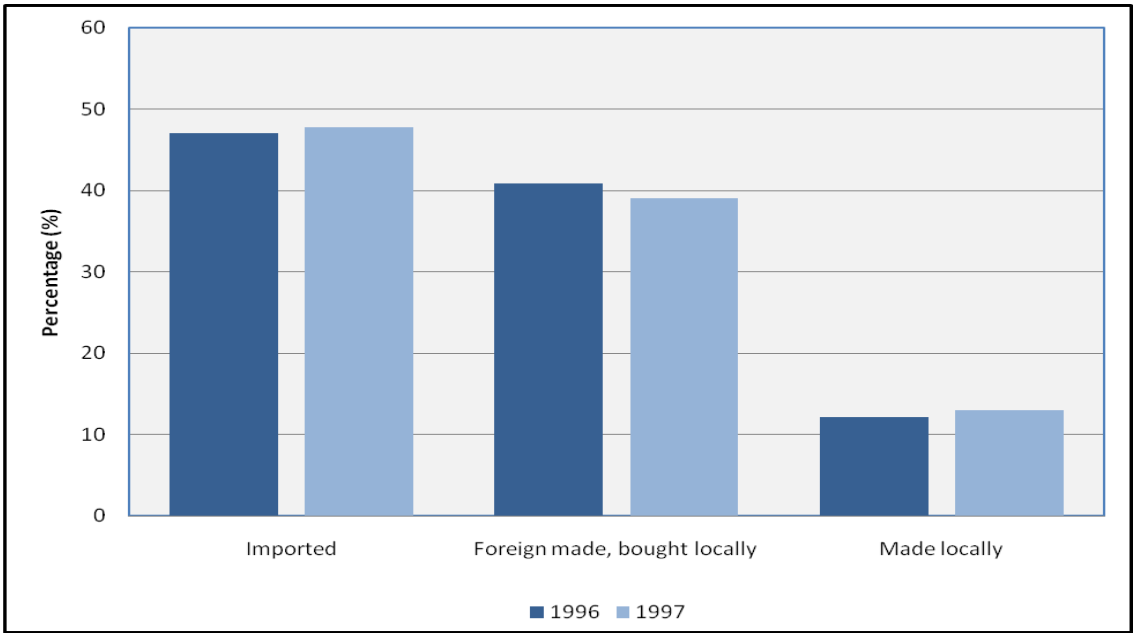
Source: Author's Computation from RPED/GMES Wave 5

The majority of equipment acquired by firms was foreign in origin, either acquired directly overseas or bought locally. Figure 6.3 shows that over 80 percent of all equipment acquired for 1996 and 1997 was made overseas. So far we have observed that the majority of firms acquired new equipment, which is foreign in origin. Thus, based on the argument that imported equipment represents a means by which

[51] The conversion from Cedis to US$ was done using the average exchange rate between the Cedi and US dollar for 1996 and 1997 sourced from African Development Bank statistical year book, 2007

technology can be acquired, we expect that the majority of manufacturing firms purchased equipment and machinery for this purpose. But how do we know?

Figure 6.3: Sources of Plant and Equipment, 1996 and 1997

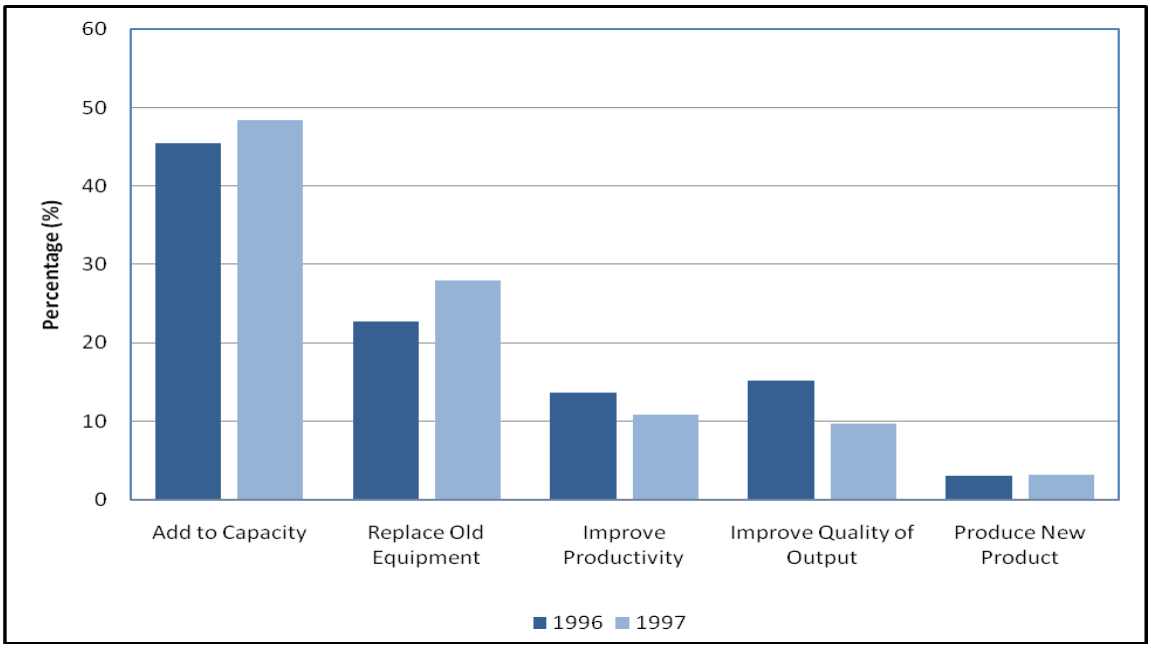


Source: Author's Computation from RPED/GMES Wave 5

To estimate the extent to which purchases of new equipment can be described as constituting technological activities by manufacturing firms, we use additional information (from the questionnaire) on the uses to which newly acquired equipment was put. Figure 6.4 presents information on the uses to which newly acquired equipment was put for 1996 and 1997. This shows that many firms, 46 percent in 1996 and 48 percent in 1997, acquired new equipment in order to expand capacity or replace old equipment.

However, based on the set responses available to firms, we define technological activities to include the following: improving productivity, improving the quality of output, and producing a new product. An examination of Figure 6.4 shows that relatively fewer firms, approximately 20 percent, acquired new equipment for technological activities. This suggests a low prevalence of technological activities among manufacturing firms in Ghana.

Figure 6.4: Intended Uses of Equipment by Manufacturing Firms, 1996 and 1997



Source: Author's Computation from RPED/GMES Wave 5

We now turn our attention to exploring the differences in technological activities between foreign and domestic manufacturing firms. Of the 274 manufacturing firms with valid responses on ownership of firms, thirty-four firms (12 percent) are identified as foreign firms whilst the remainder are domestic firms. In respect of measures for technological activities, we find that of the thirty-four foreign firms, only nine (26 percent) provided responses.

Table 6.1 presents the responses to the question on the source of plant equipment by foreign firms. The responses show that all the foreign firms acquired plant and equipment that was imported or made overseas. This finding is however not unexpected, because we would expect that foreign firms are more likely to acquire plant and equipment made overseas. With regard to the status of the equipment acquired, all nine firms indicated their equipment was new, whilst for 1996 eight firms acquired new equipment with one firm acquiring used equipment.

Table 6.1: Sources of Equipment Acquired, Foreign Firms, (1996 and 1997)

Origin of Equipment	**1996**	**1997**
Imported	7 (78%)	9 (100%)
Foreign made, bought locally	2 (22%)	0
Made locally	0	0
Total	9	9

Source: Author's Computation from RPED/GMES Wave 5

Table 6.2 presents information on the intended uses of equipment acquired by foreign firms. If we exclude the responses to *adding to capacity* and *replacement of old equipment*, we find that three firms (33 percent) in 1997 and five firms (55 percent) in 1996 acquired equipment that can be described as constituting technological activities.

Table 6.2: Intended Uses of Equipment, Foreign Firms (1996 and 1997)

Intended Uses of Equipment	1996	1997
Add to Capacity	4 (44.4%)	3 (33.3%)
Replace Old Equipment	0	3 (33.3%)
Improve Productivity	1 (11.1%)	1 (11.1%)
Improve Quality of Output	3 (33.3%)	2 (22.2%)
Produce New Product	1 (11.1%)	0
Total	9	9

Source: Author's Computation from RPED/GMES Wave 5

With regard to domestic firms, we observe a relatively higher response rate to the set of questions on equipment acquisition and use. Of the 240 domestic firms, eighty-four (35 percent) provided to responses for 1997 and fifty-seven (24 percent) provided responses for 1996. Table 6.3 presents information on the sources of equipment acquisition for domestic firms, which shows that the majority of firms, 86 percent in 1996 and 1997, acquired equipment that was made overseas. The remaining 14 percent used locally made equipment. Table 6.4 also shows that that the majority of domestic firms, approximately 53 percent in 1996 and 66 percent in 1997, acquired equipment that was new.

Table 6.3: Sources of Equipment, Domestic Firms (1996 and 1997)

Origin of Equipment	1996	1997
Imported	24 (42.1%)	36 (43%)
Foreign made, bought locally	25 (43.9%)	36 (43%)
Made locally	8 (14.0%)	12 (14%)
Total	57	84

Source: Author's Computation from RPED/GMES Wave 5

Table 6.4: Status of Equipment, Domestic Firms (1996 and 1997)

Status of Equipment	1996	1997
New	30 (52.6%)	55 (65.5%)
Used	17 (29.8%)	23 (27.4%)
Mixed	10 (17.5%)	6 (7.1%)
Total	57	84

Source: Author's Computation from RPED/GMES Wave 5

What is the extent of technological activities undertaken by domestic firms? Table 6.5 presents information on the intended use of equipment by domestic firms for 1996 and 1997. Approximately 23 percent in 1997 and 28 percent in 1996 can be described as engaging in technological activities.

Table 6.5: Intended Uses of Equipment by Domestic Firms (1996 and 1997)

Intended Uses of Equipment	1996	1997
Add to Capacity	26 (45.6%)	42 (50%)
Replace Old Equipment	15 (26.3%)	23 (27.4%)
Improve Productivity	8 (14%)	9 (10.7%)
Improve Quality of Output	7 (12.3%)	7 (8.3%)
Produce New Product	1 (1.8%)	3 (3.6%)
Total	57	84

Source: Author's Computation from RPED/GMES Wave 5

Because of the relatively small number of foreign firms in the sample, we hesitate to carry out any comparison between domestic and foreign firms. However, our discussion so far indicates that the proportion of foreign firms engaged in technological activities is greater than that for domestic firms. This probably suggests that foreign firms are more likely to engage in technological activities compared with domestic firms. Nevertheless, the relatively small number of foreign firms in the sample does not warrant a strong enough conclusion as to whether foreign firms are more likely to engage in technology transfer activities compared with domestic firms.

6.1.3 Technological Activities by Manufacturing Firms, World Bank Enterprise survey

In this section we examine the technological activities undertaken by manufacturing firms using data from the World Bank Enterprise survey 2007. We rely on two questions under the section *Capacity and Innovation* in the survey questionnaire to examine the technological activities undertaken by firms. The two specific questions identified are: whether a firm used technology licenced from a foreign owned company in production, and whether the firm had an internationally recognised quality certification (ISO 9000, 9002, 14000 etc.).[52] These two questions, particularly on the use of foreign licences in our view clearly capture the extent of technological activities

[52] There is no indication if the "foreign-owned company" was located in Ghana or outside.

undertaken by firms. As we have seen in the literature review chapter, foreign licences represent one of the means by which technology is transferred from one country to another. However, in the case of domestic firms the use of foreign licences could also indicate the level of technological activities undertaken by these firms.

Table 6.6 presents information on the use of foreign licences by all manufacturing firms. Of the 313 manufacturing firms, 292 valid responses were obtained. Table 6.6 shows that 13 percent of manufacturing firms indicated they used technology licenced from a foreign owned company, whilst 87 percent did not. This also reveals (as we saw in the preceding section) a low prevalence of technological activities among manufacturing firms in Ghana.

Table 6.6: Use of Foreign Licences in Production by all Manufacturing Firms

Use of Foreign Licences in production	Frequency	Percent	Valid Percent
Yes	37	11.8	12.7
No	255	81.5	87.3
Total	292	93.3	100.0
Missing	21	6.7	
Total	313	100.0	

Source: Author's Computation from World Bank Enterprise Survey dataset

Further confirmation of this low prevalence of technological activities is presented in Table 6.7, which presents information on the use of internationally recognised quality ISO certification. The acquisition and use of ISO certification signifies the willingness by firms to be competitive internationally, or to compete in domestic markets with imported goods. Firms with ISO certification are therefore also likely to be investing in modern technologies in their production process. Table 6.7 reveals that 6.5 percent manufacturing firms use an internationally recognised ISO quality certification in production. This is a very small percentage compared with the number of firms using foreign licences. Thus, on average we find that the extent of technological activities by manufacturing firms is very low.

Table 6.7: Use of ISO Certification in Production by all Manufacturing Firms

Use of ISO Certification	Frequency	Percent	Valid Percent
Yes	19	6.1	6.5
No	273	87.2	93.5
Total	292	93.3	100.0
Missing	21	6.7	
Total	313	100.0	

Source: Author's Computation from World Bank Enterprise Survey dataset

To gauge if there is any difference between domestic and foreign firms in respect of technological activities, we split the sample into foreign and domestic firms. There are 21 foreign firms (7 percent) in the sample of the 313 manufacturing firms. As in the case of RPED and GMES data this points to a very low representation of foreign firms in the two datasets.

Table 6.8 summarises information on the use of foreign licences in production for both foreign and domestic manufacturing firms. We find that the proportion of foreign firms undertaking technological activities is nearly three times that of domestic firms; only 10 percent of domestic firms use foreign owned licences in production compared to nearly 50 percent of foreign firms. This pattern is repeated with regard to the use of ISO certification (reported in Table 6.9). We find that 52 percent of foreign firms had internationally recognised quality certification compared with 3 percent of domestic firms.

Table 6.8: Use of Foreign Licences in Production, Domestic and Foreign Firms

	Foreign Firms	Domestic Firms	Total
Use of Foreign Licences	10 (48%)	27 (10%)	37
Don't Use Foreign Licences	11 (52%)	244 (90%)	255
Total	21	271	292

Source: Author's Computation from World Bank Enterprise Survey dataset

Table 6.9: Use of ISO Certification in Production, Domestic and Foreign Firms

	Foreign Firms	Domestic Firms	Total
Use of ISO Certification	11 (52%)	8 (3%)	19
No Use of ISO Certification	10 (48%)	263 (97%)	273
Total	21	271	292

Source: Author's Computation from World Bank Enterprise Survey dataset

Evidently, the proportion of domestic firms using ISO certification is smaller than those using foreign licences, probably suggesting that domestic firms are less interested in meeting international standards and/or competing with imported products than foreign firms in the domestic market. The use of ISO certification may also be necessary for firms intending to penetrate export markets. Because the data have not been broken down into sectors we are unable to provide details of the types of firms that are likely to use foreign licences or ISO certification in production. The general impression from Tables 6.8 and 6.9 is that foreign firms are more likely to use foreign licences and ISO certification than domestic firms. The implication here regarding international competitiveness is obvious; foreign firms because they are more likely to engage in technological activities are more likely to be competitive than domestic firms.

In summary, our analyses of the three datasets – our own survey data, RPED and GMES and WBES – have yielded interesting results regarding the technological activities by manufacturing firms in Ghana. First, information from the RPED and GMES and the WBES suggests that on average the extent of technological activities across the entire manufacturing sector is generally low. Our conclusions are similar to that by Biggs et al. (1995) who also observe that the level of technological capabilities in African manufacturing is low.

We also find differences between domestic and foreign firms with regard to technological activities. The evidence from the RPED and GMES and the WBES reveals that foreign firms are more likely to engage in technological activities compared with domestic firms. Furthermore, evidence from our own survey revealed that approximately 57 percent of FDI firms engage in technology transfer. These conclusions are not robust in the sense that we cannot undertake rigorous statistical and econometric analyses using these different datasets, all of which approach the issue of technological activities differently. Nonetheless, and with a great deal of caution, it appears to suggest that on average foreign firms are more likely to engage in technological activities, such as improve their productivity, innovate their production process, or introduce new products, compared to domestic firms.

6.2 Assessing the Extent of Skills and Technological Knowledge Transfer via Formal Training by Firms

In this section we examine the extent to which manufacturing firms are engaged in the transfer of skills and technological knowledge via the provision of formal training to workers, and assess whether FDI firms are more likely to provide formal training to workers compared to domestic firms. Acemoglu (1997) and Tan and Lopez-Acevedo (2003) observe that the training of workers is most essential and more likely when new technologies are adopted. Further, Acemoglu (1997: 446) notes that evidence from surveys suggests that the "availability of appropriate skills is a key determinant of innovation and technology adoption decisions". In the context of MNEs for example, Slaughter (2002) and Miyamoto (2003) have argued that the provision of on-the-job training as well as other forms of vocational training to workers – both those employed by MNEs and other domestic firms – are important activities MNEs undertake in developing countries. Hence, we expect FDI firms to be more likely to provide formal training to workers compared with domestic firms.

Further, we argue that with regard to deliberate efforts to impart new technology and production techniques to workers, the provision of formal training to workers represents the most effective means of knowledge transfer. In other words, we see formal training, as learning that is the result of more deliberate efforts to create the capacity to assimilate and use knowledge effectively.[53] We define formal training to involve a set of activities that impart skills and technological knowledge – knowledge regarding the effective utilisation of plant and machinery – to workers.

The emphasis on formal training as the basis for the transfer of skills and technological knowledge is based on the fact that some aspects of technology are tacit in nature. In the case of FDI for example, we will expect that the intangible assets that are endogenous to FDI are more likely to be transferred to domestic workers via formal training.[54] Hence, when FDI firms are established we will expect that some of their activities will not only be associated with the transfer of machinery and equipment, but

[53] It is however conceivable that informal on-the-job training also involves the transfer of some knowledge to workers. But, we expect that this type of training is probably most likely to be prevalent in almost all firms; newly recruited workers would most likely undergo some kind of informal training in order to have them acquainted with the new work environment. On-the-job training could also be a way to get workers acquainted new machinery, or be equipped with rudimentary skills needed to effectively function in the firm.

[54] But it is possible that workers in domestic firms can acquire technological knowledge through formal training provided by expatriates.

also the transfer of what Djankov and Hoekman (2000: 51) describe as "soft technologies, such as management and information" as well as other types of skills and technological knowledge. We assume that the transfer of this type of technology is most effectively achieved through formal training within the firm.

Thus, the basic idea here is that FDI firms after being established need to train the (new) workers employed in order to achieve a desired level of efficiency. We suppose that the management of FDI firms possess intangible assets – soft technologies – which can only be transferred through training of workers. Although training can involve both formal training for various categories of workers and other informal and on-the-job training programmes, our emphasis in this section is on the provision of formal training as a means for the transmission of skills and technological knowledge.[55] Consequently, we expect that FDI firms will be more likely to provide training for their workers compared with domestic firms that are already established. This approach however is not restricted to subsidiaries of multinationals. Indeed, we extend the concept of the FDI firm to include small multinationals and foreign entrepreneurs.

6.2.1 The Transfer of Skills and Technological Knowledge via Formal Training by FDI Firms (Own Survey)

In our survey, the indicator to estimate the extent of training provided to workers is categorised into two – formal and informal. Formal training refers to training programmes that take place within or outside the firm in which workers are actively encouraged to take part. Informal training refers to the provision of on-the-job training for workers, the use of a mentoring scheme to improve the skills of managers and supervisors, and in-house training schemes that may be provided to workers by senior managers. In Figures 6.5 and 6.6 we reproduce the responses to the questions on formal and informal training provided by FDI firms to their workers from Chapter 5.

We observed that the extent of formal training – which was used as an indicator of the extent skills and technological knowledge transfer – varies across the range of different types of formal training explored. We find in Figure 6.5 for example that there are relatively fewer firms providing training in marketing techniques (10 percent)

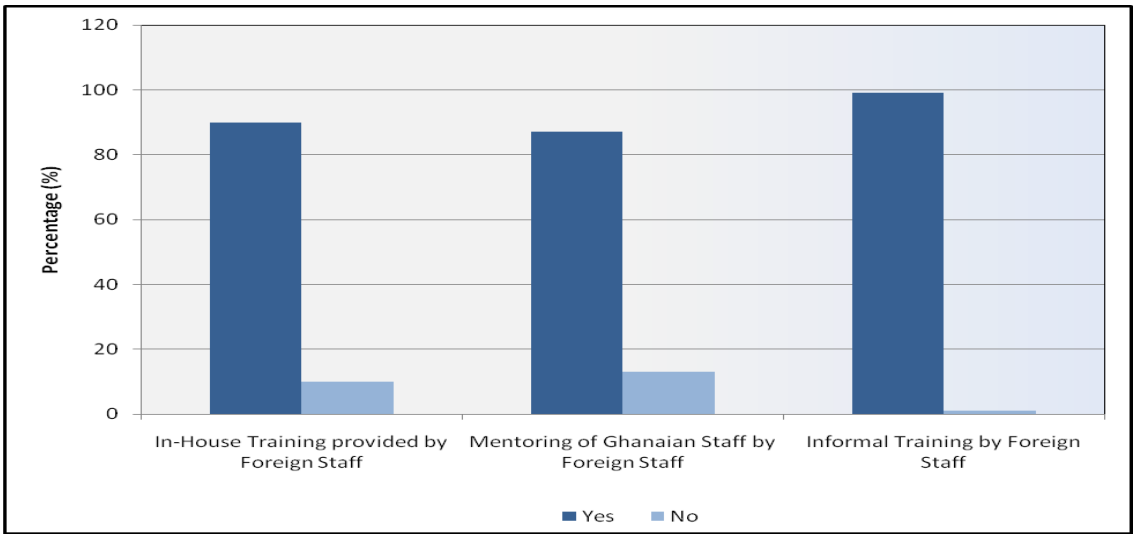
[55] It is difficult to observe adequately the formal training mechanisms available in firms and therefore we rely on responses provided by firms to questions on the provision of formal training to their workers.

compared to the number providing training in operations and production management (41 percent of firms). What is apparent is that the majority of firms (at least 59 percent of firms) do not provide formal training to workers. On the other hand, the majority of firms – at least 80 percent – provide informal training schemes for workers. It is thus apparent that the majority of FDI firms are more likely to provide workers with training in rudimentary skills (if we assume that this is what informal training involves) to enable them to work as productively as possible. However, the evidence also suggests that not many FDI firms are likely to provide formal training to workers; and where training is provided, production workers and supervisors are more likely to receive any type of training compared with middle to senior managers (see Figure 6.6).

Figure 6.5: Formal Training and Skills Transfer Provided by FDI Firms

Source: Author's computation from survey responses

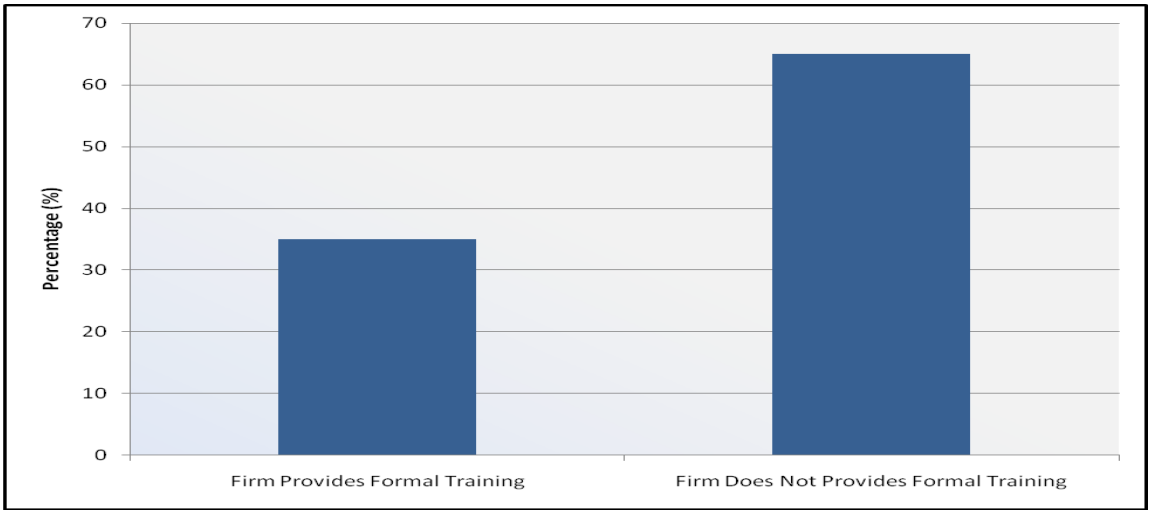
Figure 6.6: Informal Training Provided by FDI Firms



Source: Author's computation from survey responses

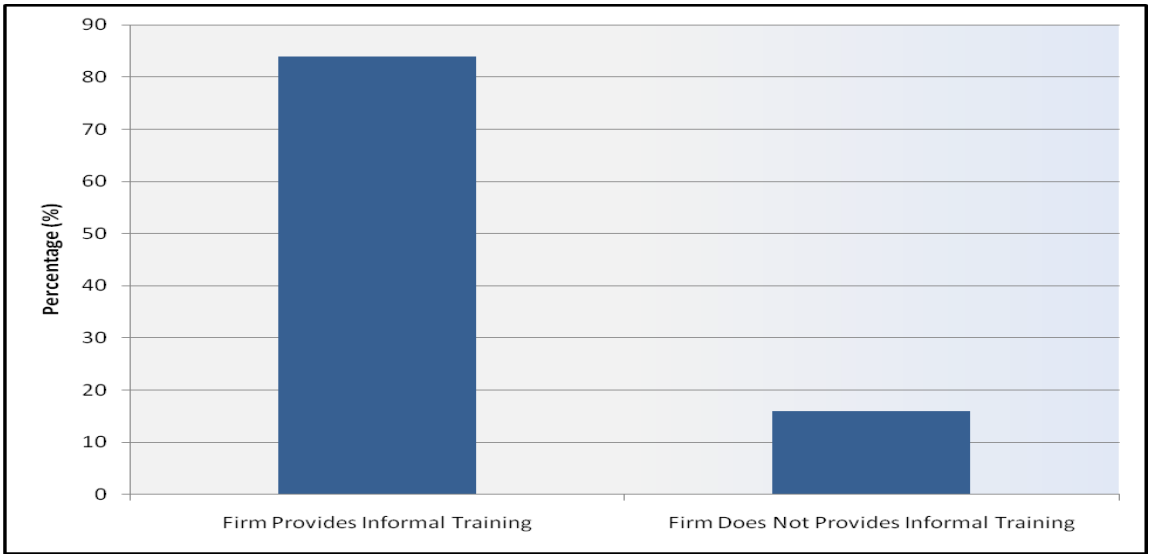
Using data on responses to formal and informal training provided by firms, we construct a crude measure of formal and informal training for all firms to estimate the extent to which FDI firms are engaged in the transfer of skills and technological knowledge. We use the same approach in constructing the proxy measure for product and process technology transfer in Section 6.1.1. We assign 1 for firms that answer "Yes" to each of the questions on formal training, and 0 if this condition is not satisfied. We carry out a similar exercise for the indicators of informal training. Figure 6.7 presents the proxy measure for the transfer of skills and technological knowledge by FDI firms, whilst Figure 6.8 presents a proxy measure for informal training provided by FDI firms.

Figure 6.7 Proxy Measure for Skills and Technological Knowledge Transfer by FDI Firms



Source: Author's computation from survey responses

Figure 6.8: Proxy Measure for Informal Training Provided by FDI Firms



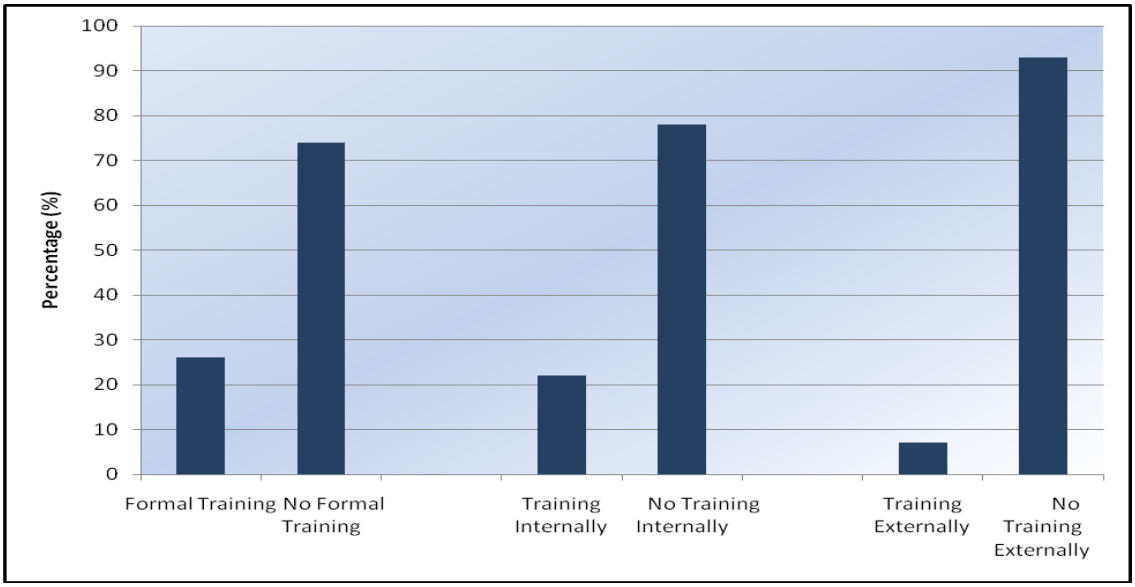
Source: Author's computation from survey responses

In Figure 6.7 we find that 35 percent of firms provide formal training to workers, indicating that relatively fewer FDI firms are engaged in activities that results in the transfer of skills and technological knowledge to their workers. In Figure 6.8, which presents the proxy measure for informal training, we find that 84 percent of firms provide informal training to workers, which as we have argued earlier is likely to occur in most FDI firms. Because the construction of this proxy measure for skills and technological knowledge transfer potentially leaves out firms that do not satisfy the strict condition, we can only suppose that the low percentage is indicative of the extent to which FDI firms are engaged in the transfer of skills and technological knowledge.

6.2.2 Assessing the Extent of Formal Training by Manufacturing Firms, World Bank Enterprise Survey

Using information from the World Bank Enterprise survey we are able assess the extent of formal training by manufacturing firms. The questionnaire specifically asked whether firms run formal training programs for its permanent, full-time employees. Two subsequent questions regarding training were also asked, that is, whether training was offered internally within the walls of the firm or externally outside the walls of the firm. The responses to these questions are presented in Figure 6.9. Of the 313 manufacturing firms, we find that nearly 26 percent of manufacturing firms provide formal training to their workers, whilst 22 percent provide training internally. Relatively fewer manufacturing firms, approximately 7 percent, provided training to workers outside the walls of the firm. The evidence suggests that on average the extent of formal training across the manufacturing sector is minimal.

Figure 6.9: Formal Training and Internal and External Training provided by Manufacturing Firms



Source: World Bank Enterprise Survey, 2007

To assess the extent of formal training provided by foreign and domestic firms, we split the WBES data into foreign and domestic manufacturing firms. The responses are presented in Table 6.9 and 6.10. In Table 6.9 we find that the proportion of foreign firms providing training for workers, 62 percent, is higher than the proportion of domestic firms providing training for workers, 23 percent. We also observe similar patterns in the case of internal and external training. The proportion of foreign firms providing internal and external training for their workers is 57 percent and 14 percent, respectively. This proportion is higher than that for domestic firms, where we find 20 percent and 7 percent providing internal and external training, respectively.

Table 6.9: Formal Training by Domestic and Foreign Firms

	Foreign Firms	**Domestic Firms**	**Total**
Formal Training Provided	13 (62%)	68 (23%)	81
No Formal Training Provided	8 (38%)	224 (77%)	232
Total	21	292	313

Source: Author's Computation from World Bank Enterprise Survey dataset

Table 6.10: Internal and External Training by Domestic and Foreign Firms

	Foreign Firms	Domestic Firms	Total
Internal Training Provided	12 (57%)	58 (20%)	70
No Internal Training Provided	9 (43%)	234 (80%)	243
Total	**21**	**292**	**313**
External Training Provided	3 (14%)	20 (7%)	23
No External Training Provided	18 (86%)	272 (93%)	290
Total	21	292	313

Source: Author's Computation from World Bank Enterprise Survey dataset

The evidence from Tables 6.9 and 6.10 suggests that foreign firms are more likely to provide formal training for workers than domestic firms. Given that the number of foreign firms is very small compared to domestic firms, our conclusion is only tentative and suggestive. Nevertheless, this finding is similar to that by Gerschenberg (1987) in a study on the training of managerial know-how by multinational firms and other firms in Kenya. His study found that subsidiaries of multinationals and joint-ventures were more likely to provide training for Kenyan managers compared with domestic public enterprises.

6.2.3 Assessing the Extent of Training within Firms, RPED and GMES

There is no information on the extent of formal training provided to workers by manufacturing firms in the RPED and GMES dataset. Information is however available on on-the-job training to workers. In this regard we only briefly summarise information on the extent of informal training provided to workers by firms. The data available are on a sample of workers from firms surveyed in 1998 during the fifth round of the RPED and GMES; a sample of ten workers from each firm was to be selected and interviewed. The objective was to interview at least one worker from various categories of employment, ranging from employed/proprietor manager, professional service worker, such as, engineers or technicians, to production workers and office workers.

However, there is no information on which categories of workers were eventually interviewed. Further, it appears that the number of workers interviewed in each firm was not always ten, in some cases the number of workers were less than ten. On the specific issue of training, the questions asked related to on-the-job training and

short courses lasting not more than six months. For example, workers were asked if they currently received on-the-job training (as in the year and period of the survey, which was September 1998), whether they had received any on-the-job training in the past, and whether they had ever attended any short training courses lasting not more than six months.

The responses to these questions have been summarised in Table 6.11, which indicates that a low percentage of workers receive on-the-training in general across the manufacturing sector. In the year of survey (1998), of the 1,154 workers who were interviewed, 7.5 percent reported they were currently receiving on-the-job training; that is, training provided within the firm and outside the firm. Given the dynamic nature of firm operations and consequently the training provided for workers, this information is probably biased and unrepresentative of the extent of training provided by firms.

Table 6.11: The Proportion of Workers with Previous on-the-job Training, All Firms, Foreign Firms and Domestic Firms, RPED and GMES

	All Firms	**Foreign Firms**	**Domestic Firms**
Yes	389 (34%)	52 (35%)	**337 (34%)**
No	750 (66%)	97 (65%)	**653 (66%)**
Total	1139	149	**990**
Number of Workers with Current on-the-job Training (1998)			
	All Firms	**Foreign Firms**	**Domestic Firms**
Yes	86 (7.5%)	7 (5%)	**79 (8%)**
No	1068 (92.5%)	142 (95%)	**926 (66%)**
Total	1154	149	**1005**
Number of Workers Ever Attended Other Short Training Courses (At Most 6 Months)			
	All Firms	**Foreign Firms**	**Domestic Firms**
Yes	84 (7%)	10 (7%)	**74 (8%)**
No	1050 (93%)	139 (93%)	**911 (92%)**
Total	**1134**	**149**	**985**

Source: Author's Computations from Wave 5 of RPED/GMES

Of the 1,139 workers who responded to the question on whether they had received previous on-the-job training, 34 percent indicated they had received training. An even lower proportion of workers, 7 percent, indicated they had previously attended short training courses lasting not more than six months. It appears that there is very little provision of formal training, evidenced by the relatively small percent of workers who reported ever attending short training courses. But this situation whereby very few

workers receive training is probably a reflection of very few firms in the RPED/GMES survey accessing or receiving training provided by a range of organisations (see Appendix Figures A.2 – A.6). Thus, it is conceivable to argue that if firms are less likely to access formal training programmes available to them, then they will be less likely to provide formal training for workers they employ.

We also find very little difference between foreign firms and those employed by domestic firms in terms of the provision of on-the-job training for workers. In Table 6.11, we find that the proportion of workers who received on-the-job training in the past were approximately the same in both foreign and domestic firms. This similarity is observed in the case of those who had previously attended short training courses with duration of at most six months.

6.2.4 Are Formal Training Programmes More Likely in Foreign Firms?

The preceding discussions on the extent of training provided by firms to workers reveals that in general the number of workers taking part in formal training programmes is generally low across the manufacturing sector. Evidence from our own survey of FDI firms indicates that approximately 35 percent of firms have formal training schemes for their workers. On the other hand, most FDI firms provide various forms of informal training to workers; this is apparently the dominant type of training workers receive. We also find that evidence from the World Bank Enterprise survey, suggests that a higher proportion of foreign firms are more likely to provide formal training to their workers compared with domestic firms. Does this suggest that foreign firms are more likely to offer formal training schemes to their workers than domestic firms? Judging by the difference between the proportions for foreign and domestic firms, this is probably the case. But how can this noticeable difference be statistically verified?

A very common approach when faced with two groups (in our case two different datasets) is to compare some characteristics of these samples. For categorical data, this is done by comparing proportions for the characteristics of interest (for example, number of firms providing formal training for workers or engaged in exporting), whilst for quantitative data, it is a comparison of means. However, for this kind of comparison to be carried out responses in each group must be independent of

those in the other (group), that is, they must be different, unrelated and unpaired. Nonetheless, sample sizes may vary between the two groups. The statistical method of comparing proportions is a way to verify statistically if the observed differences are indeed true for the sample. To do this we follow the approach in Agresti and Finlay (1997: 219-220) and Newbold et al. (2010; 428-431) to test for differences between proportions for large samples. The formula for testing the equality of two population proportions and the test of significance for this test is presented in Appendix A.8.

Using information on formal training from the World Bank Enterprise survey, we test the hypothesis that the proportion of foreign firms offering formal training is greater than that of domestic firms. We first carry out this comparison in spite of the relatively small number of foreign firms in the World Bank Enterprise survey. However we believe the total number of firms is large enough to permit a satisfactory comparison between foreign and domestic firms. The results are presented in Table 6.12. The test statistic confirms that at both the 95 percent and 99 percent level of confidence, the proportion of foreign firms offering formal training is higher than that for domestic firms. But how certain are we regarding this conclusion given the small number of foreign firms in the entire sample? We explore this further by comparing the proxy measure for formal training from our survey with the proportion of domestic firms providing formal training from the World Bank Enterprise survey. The outcome of this quasi-comparison of proportions must be treated with caution for reasons previously stated in preceding sections of this study.

Table 6.12: Test Comparing Proportion of Foreign Firms and Domestic Firms (Providing Formal Training)

Description of Variables	Value
P_f is the proportion of foreign firms offering formal training to workers	0.62
P_d is the proportion of domestic firms offering training to workers	0.23
n_f is the number of foreign firms	21
n_d is the number of domestic firms	292
$\hat{P}$ is the pooled estimate for both proportions	0.256166134
$S.E._{\hat{p}}$ is the standard error for the pooled estimate	0.098621
Z_{cal} is the test statistic	3.95428*

Note: Significant at the 0.05 level of significance

However, to be convinced that this quasi-comparison of proportions can be carried out satisfactorily, we first examine whether the two datasets are comparable in at least one important firm-specific characteristic. Given that both surveys are fairly recent and have information on the year of establishment for firms, we use the age of firms as the indicator for comparing the two datasets.[56] Although other firm characteristics can be used, we believe that age is probably the most appropriate characteristic to use in this assessment. In Table 6.13 we present summary statistical information on the age of firms from the two datasets. The World Bank Enterprise survey data is further split into domestic and foreign firms.

Our main interest however is in comparing the basic statistical information on age of FDI firms from our survey and domestic firms from the World Bank Enterprise survey. On this point we observe that the values for the mean age and standard deviation are very close. Thus, with a mean age of firms that is close in both datasets, we can argue that the firms are fairly alike in terms of age, although this does not suggest that they are similar in other characteristics. There is enough reason to believe the distribution by sizes will differ, because we observed in Chapter 5 that FDI firms in our survey tended to be relatively larger in size compared with firms in the RPED and GMES or the WBES.

Table 6.13: Basic Statistical Information on Age Distribution (Our Survey and World Bank Enterprise Survey Datasets)

Descriptive Statistics	Own Survey (FDI Firms)	WB Enterprise Survey (All manufacturing)	WB Enterprise Survey (Domestic Firms)	WB Enterprise (Foreign Firms)
Valid N (Listwise)	69	312	291	21
Minimum	2	1	1	2
Maximum	53	76	61	76
Mean	14.41	15.99	15.61	21.24
Standard Deviation	12.489	12.026	11.451	17.793
Variance	155.980	144.633	131.135	316.590
Skewness	1.861	1.513	1.350	1.667
Standard Error	0.289	0.138	0.143	0.501

Source: Author's computation using own survey and World Bank Enterprise survey datasets

[56] The reference year for World Bank Enterprise survey is 2006, whilst that for our survey is 2008.

In spite of these possible differences, we nonetheless attempt to establish if there is any difference between the activities of FDI firms from our survey and domestic firms from the World Bank Enterprise survey. In this regard, we first try to establish if there is any difference between the variances, in respect of the age of firms. This test is only to statistically confirm what is apparent from the Table 6.13; because the variance of the age of FDI firms from our survey is not twice that of domestic firms from the WBES we can assume that the variances are equal. The formula for the statistical test of equality of variance (age of firms) and the results of the test are presented in Appendix A.9 and Appendix Tables A.8 – A.10. The results confirm that statistically both variances are equal.

Based on the test for equality of variances, we make the assumption that the two sets of data are independent, and thus proceed with the test of equality of proportions. We expect that the larger number of observations on FDI firms from our survey will provide a more robust result as to whether FDI firms are more likely to provide formal training schemes for workers compared with domestic firms. The test for the comparison of proportions is presented in Table 6.14.

The results presented in Table 6.14 suggests that the proportion of FDI firms that offer formal training for workers is higher than that for domestic firms. This conclusion is similar to those found by Tan and Batra (1995, 1996) in Taiwan and Malaysia Tan and LopezAcevedo (2003) in and Mexico. Our findings are only indicative, and where a better dataset with sufficiently large numbers of both groups become available, it will be possible to effectively assess whether FDI and domestic firms differ in the provision of formal training to workers in Ghana.

Table 6.14: Test Comparing Proportion of FDI Firms and Domestic Firms Providing Formal Training

Description of Variables	Value
P_f is the proportion of FDI firms offering formal training to workers	0.35
P_d is the proportion of domestic firms offering training to workers	0.23
n_f is the number of FDI firms	69
n_d is the number of domestic firms	291
$\hat{P}$ is the pooled estimate for both proportions	0.253
$S.E._{\hat{p}}$ is the standard error for the pooled estimate	0.05821
Z_{cal} is the computed test statistic	2.0615*

Note: Significant at the 0.05 level of significance

Based on the assumption that the training of workers as well as other forms of learning represent one of the means by which technology transfer can occur, we expect that firms with formal training schemes for workers are likely to offer workers an assured means of skills and technological knowledge upgrading. Thus where firms offer workers a formal scheme by which they can be trained, we argue that this represents an effective method by which technology transfer within firms can take place.

It is however important to stress that whilst the training of workers is one of means by which the transfer of skills and technological knowledge can take place, the existence of formal training schemes and other forms of informal training does not necessarily imply the transfer of modern technological knowledge occurs. What matters is the content of and purposes for which the various forms of training are provided, who provides the training, the absorptive capacity within firms, investments in innovative activities by firms, and other mechanisms that firms put in place to ensure a continuous and sustained effort to modernise and stay competitive.

To summarise our discussion so far, we have examined the extent to which the transfer of skills and technological knowledge via the formal training of workers occurs across the manufacturing sector in Ghana. Evidence from our own survey data suggests that the majority of FDI firms do not provide formal training to their workers, and where such training takes place, supervisors and production workers are more likely to be trained compared with administrative managers. Evidence from the WBES also suggests that across the manufacturing sector most firms are unlikely to provide formal training to workers, although the proportion of foreign firms providing formal training is higher than that of domestic firms.

To test if the observed differences between foreign and domestic firms in respect of the provision of formal training to workers were significant, we compared FDI firms and domestic firms with regard to the proportions in each group that provided formal training to workers. The test for the comparison of proportions confirmed that the difference between FDI firms and domestic firms was statistically significant. The economic significance of this result is that in promoting FDI, Ghana should aim at encouraging foreign investments that are most likely to engage in the transfer of skills and technological knowledge to workers, and thus become the basis for more spillover to domestic firms as workers leave to join other domestic firms or

establish their own enterprises. Furthermore, there is the need for increased government efforts to encourage domestic firms to create opportunities for their workers to access more formal training schemes. These could be done by collaborating with existing higher education institutions, government research institutions, and industry associations. By improving the skill base of domestic workers through formal training programmes, the absorptive capacity of domestic firms is also increased such that the potential spillover benefits from FDI firms to domestic firms can be effectively achieved.

Finally, because informal training schemes appear to be the most predominant form of worker training across the manufacturing sector, it will be important to improve the content of such training in order to improve workers' productivity as well as their absorptive capacity. Hence in-house, informal training should not be limited to getting new workers acquainted with the work environment or to use newly acquired equipment, but include aspects which result in the transfer of modern skills and technological knowledge.

6.3 Assessing the Exporting Behaviour of FDI and Domestic Manufacturing Firms

The export possibilities arising from FDI activity represents one of the expected benefits for host countries. Blomström (1990) for example points to the potential of FDI to expand the exports, especially of manufactures, in developing countries. Thus, while most FDI in SSA has been directed to extractive industries, it is the development of manufactures and the subsequent growth in the exports of manufactures that is most important in the development process of developing countries. Fafchamps et al. (2002) for example note the importance of manufactured exports for many poor countries, describing it as a royal path to growth. The experience of Mauritius and other East Asian countries provides enough evidence of the potential transformative role FDI can play in the economic transformation of developing countries, particularly through the development of manufactured exports and creation of new export markets.

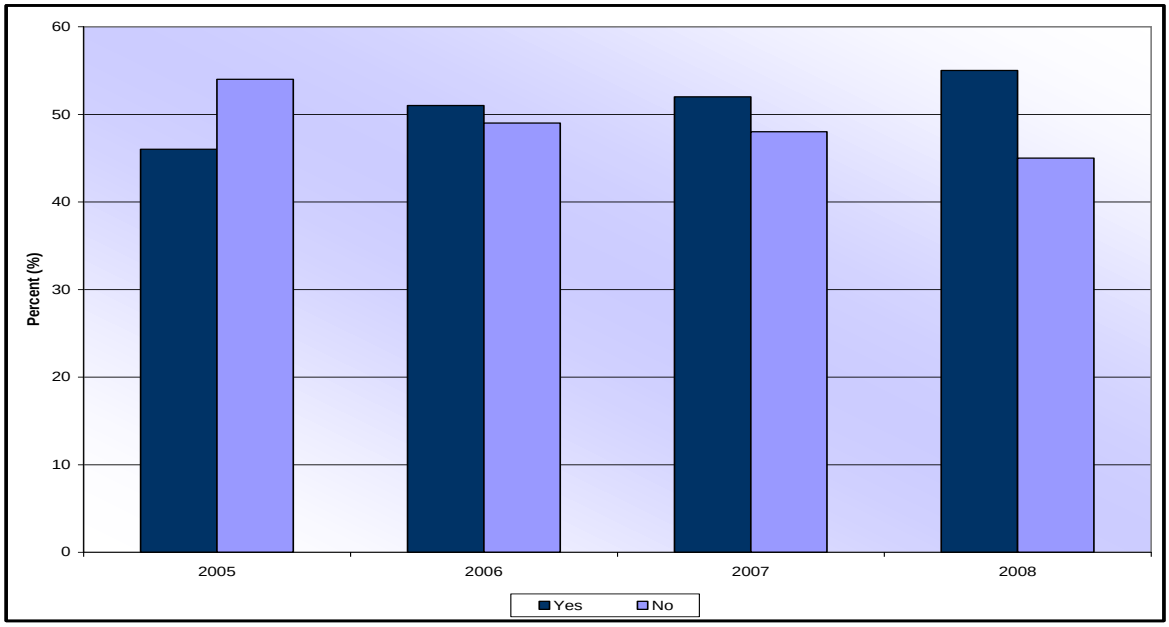
Nevertheless, it is not always the case that FDI results in improved export performance, even when there is a history of domestic firms already exporting, and/or does it lead to the development of new export markets. In respect of the potential for export growth of FDI in host countries, another important factor to be considered is the

motivation behind FDI activity. As we have seen in the literature review chapter, there are several motivations behind international production activity, some of which may not result in any development of exports at all. In this section, our primary motivation is to assess the exporting behaviour of FDI firms vis-à-vis domestic firms. As in the preceding sections we first describe the extent of exporting behaviour by manufacturing firms in all the three survey datasets being compared, and then proceed to test if the exporting behaviour of FDI and domestic firms are different, in other words, whether FDI firms are more likely to export than domestic firms.

6.3.1 The Export Behaviour of FDI Firms (Own Survey)

In our survey exporting activity was measured as any percentage of total sales exported directly by the firm. Based on this measure we found that for 2008 the proportion of firms exporting was 55 percent (see Figure 6.10). Indeed we noted in Chapter 5 that if the percentage of sales exported was increased to at least 10, the proportion of firms exporting reduces marginally to approximately 54 percent. This suggests that the majority of firms that export do so for a significant proportion of their total annual sales. Moreover, it is also evident that a substantial number of FDI firms surveyed are actively engaged in international trade.

Figure 6.10: Percentage of Firms Exporting, 2005 – 2008



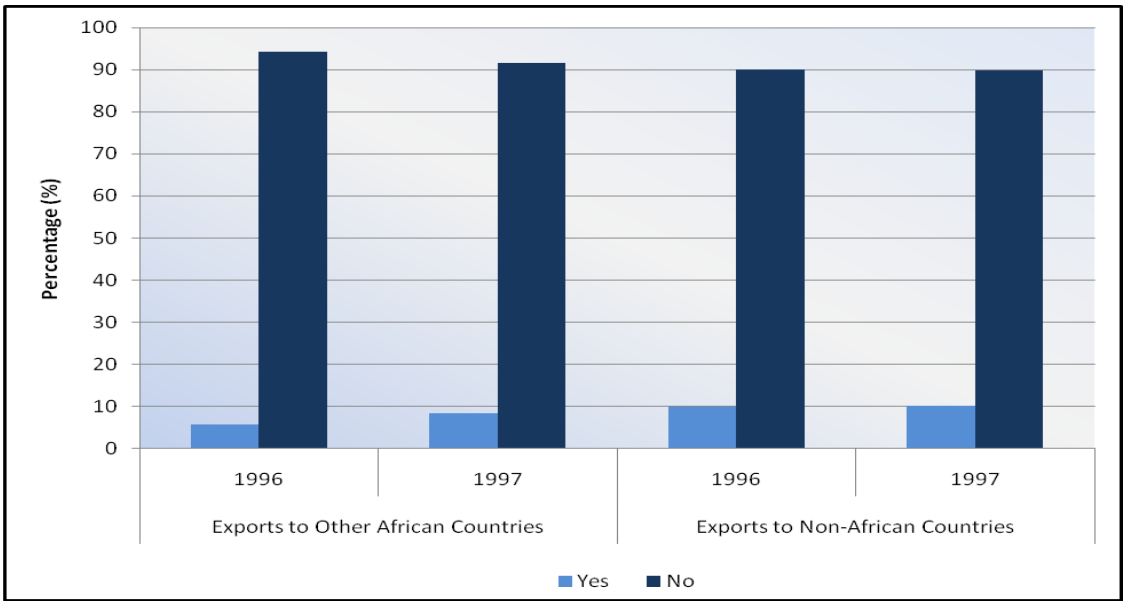
Source: Author's own computations from survey responses

6.3.2 Assessing Exporting Behaviour of Manufacturing Firms, RPED and GMES

The export behaviour of manufacturing firms in the RPED and GMES is gauged by the percentage of output exported by firms to African and Non-African countries in 1996 and 1997. The majority of firms, representing on average 85 percent, in the sample do not export. For 1996, approximately 8 percent of firms reported exporting at least 1 percent of output to another African country, although the number was slightly higher in 1997; approximately 12 percent exported to another African country.

Exports to Non-African countries also followed a similar pattern. In both 1996 and 1997, approximately 14 percent reported exporting at least 1 percent of output to a non-African country. Figure 6.11 illustrates the pattern of exporting to African and Non-African countries by all manufacturing firms for 1996 and 1997, which shows that the majority of manufacturing firms did not export at all.

Figure 6.11: Export Patterns for all Manufacturing Firms (RPED/GMES)

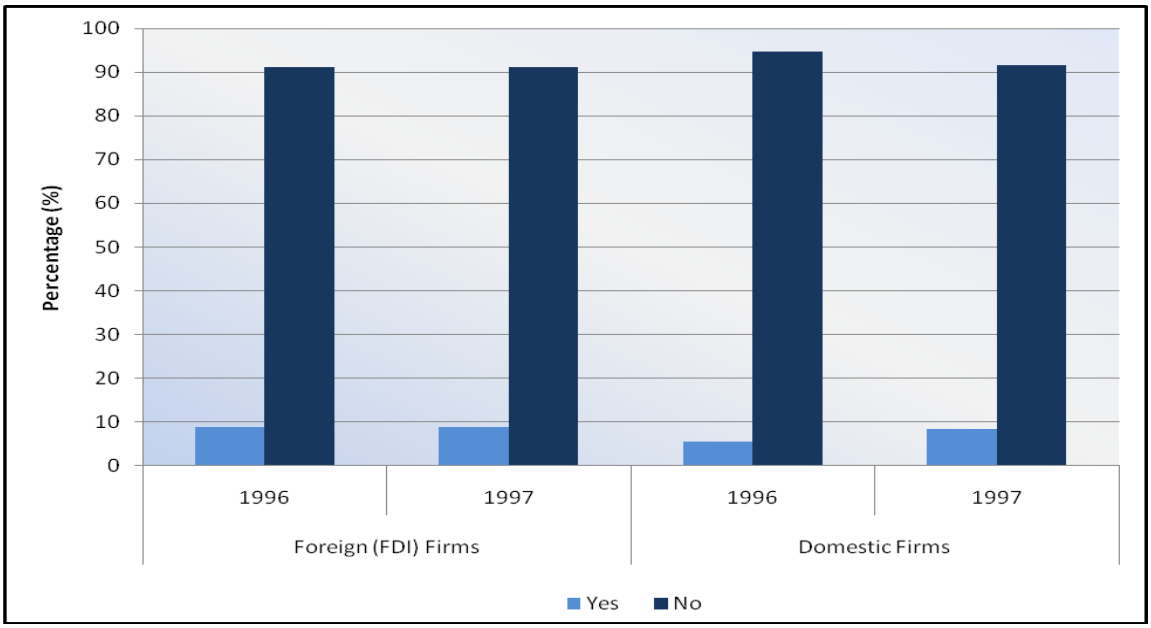


Source: Author's Computation from RPED/GMES Wave 5 dataset

We sub-divide the sample into domestic and foreign firms to explore the exporting behaviour of domestic and foreign firms. The proportion of foreign firms in the sample of 211 manufacturing firms is approximately 16 percent. Based on valid responses, we find that the number of foreign firms exporting is very small. Indeed, the number of foreign firms exporting in 1996 and 1997 to African countries was approximately 19 percent (that is, only 3 foreign firms). The proportion of foreign firms exporting to Non-African countries was even lower, approximately 7 percent in both

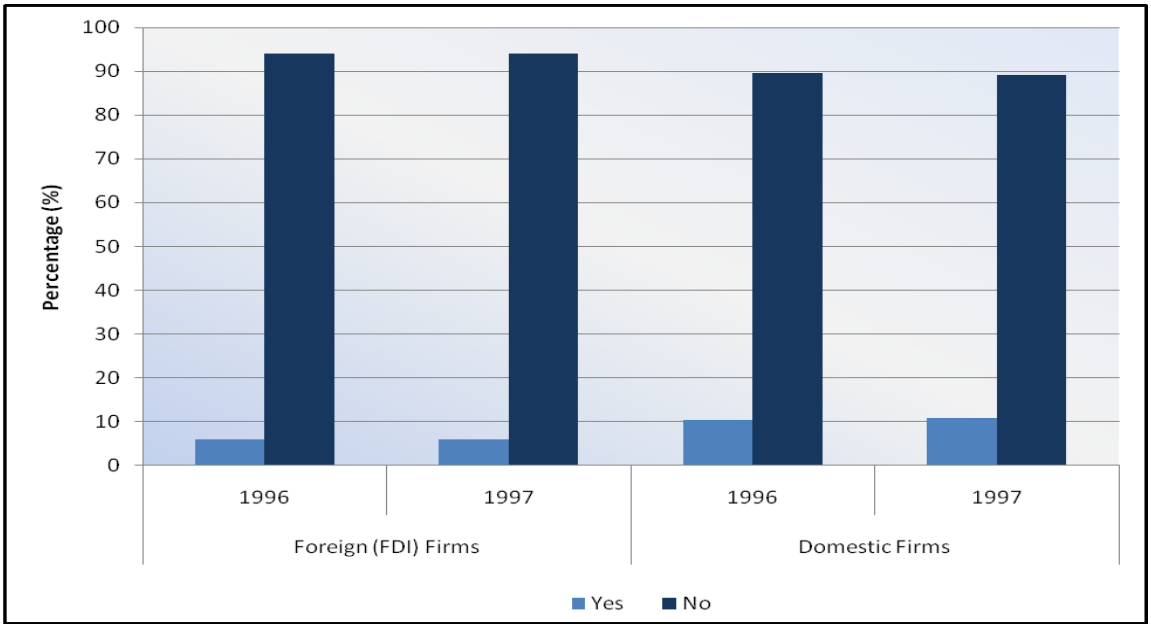
1996 and 1997. The pattern of exporting to African and Non-African firms by domestic and foreign firms is depicted in Figure 6.12 and 6.13; evidently, we find that a very low proportion of both domestic and foreign firms export.

Figure 6.12: Exports to African Countries, Domestic and Foreign Firms



Source: Author's Computation from RPED/GMES Wave 5 dataset

Figure 6.13: Exports to Non-African Countries, Domestic and Foreign Firms



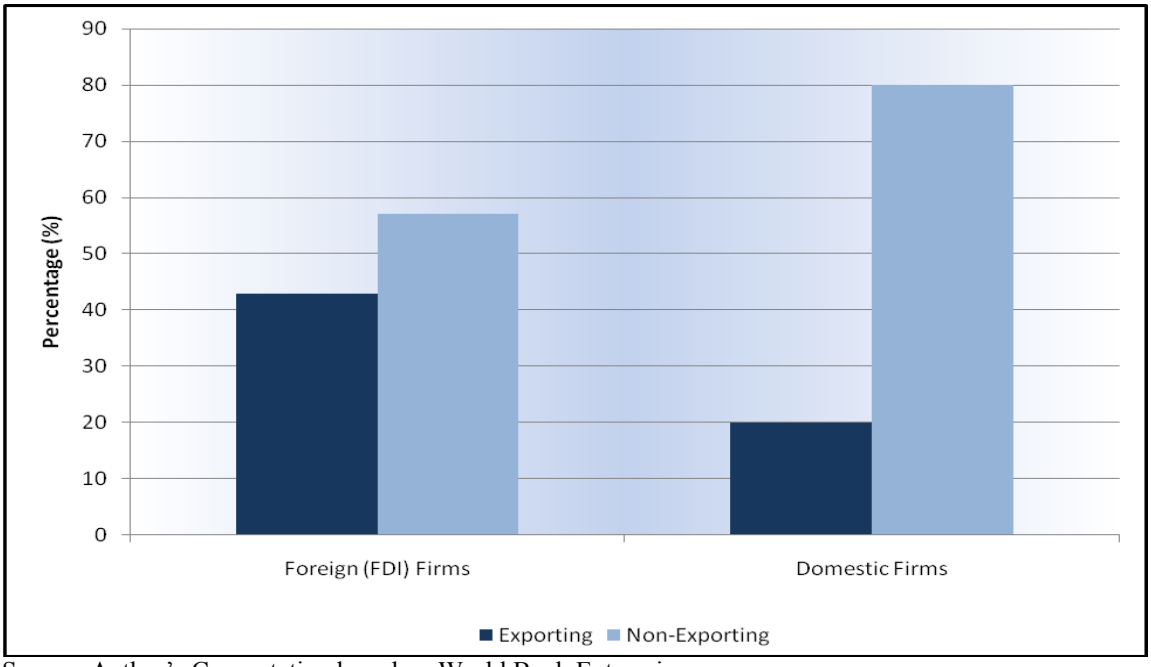
Source: Author's Computation from RPED/GMES Wave 5 dataset

6.3.3 Assessing Exporting Behaviour of Manufacturing Firms, World Bank Enterprise Survey

We follow the same approach as in the preceding sections to assess the exporting behaviour of manufacturing firms using data from the World Bank Enterprise survey. Exporting behaviour is measured based on responses to the question on the proportion of direct sales exported to the rest of the world. We find that the majority of firms do not export directly, approximately 79 percent, whilst 21 percent of firms export directly. Where the sample is sub-divided by foreign and domestic firms, we find that the proportion of foreign firms exporting is higher than that for domestic firms.

Figure 6.14 presents the pattern of exporting behaviour of domestic and foreign manufacturing firms. Of the 21 foreign firms, approximately 43 percent exported, whilst approximately 20 percent of 292 domestic firms exported. A statistical comparison of the two proportions indicated that foreign firms are more likely to export compared to domestic firms. The test statistic is statistically significant at the 95 percent confidence level (see Appendix Table A.11).

Figure 6.14: Export Activities by Domestic and Foreign Firms



Source: Author's Computation based on World Bank Enterprise survey

Due to the relatively small proportion of foreign firms in the WBES dataset, we decided to undertake a quasi-comparison of proportion between FDI firms using our own survey data and domestic firms using data from the WBES. The objective of this quasi-comparison of proportions is to ascertain whether the observed differences in exporting behaviour between foreign and domestic firms can be verified using a combination of data sources. The test results reported in Table 6.14 show that FDI firms are indeed more likely to export compared to domestic firms. This conclusion is based on the statistical difference between the proportion of FDI firms exporting and that for domestic firms.

Table 6.14: Test Comparing Proportion of FDI Firms and Domestic Firms Exporting

Description of Variables	Value
P_f is the proportion of FDI firms offering formal training to workers	0.551
P_d is the proportion of domestic firms offering training to workers	0.199
n_f is the number of FDI firms	69
n_d is the number of domestic firms	292
$\hat{P}$ is the pooled estimate for both proportions	0.26593
$S.E._{\hat{p}}$ is the standard error for the pooled estimate	0.05914
Z_{cal} is the computed test statistic	5.95347*

Note: Significant at the 0.05 level of significance

Our assessment of exporting behaviour by firms indicates that foreign-owned firms are more likely to export than domestic firms. This finding regarding the exporting behaviour of foreign and domestic firms is not dissimilar to what Waldkirch and Ofosu (2008) find in the case of Ghana. They observe that foreign-owned firms have a greater export propensity than domestically-owned firms. This finding has also been observed in the case of Moroccan firms, (Haddad and Harrison 1993; Harrison 1996). The finding that foreign firms are more likely to export compared to domestic firms is not surprising. Blomström and Kokko (1997) have argued that foreign firms have inherent technological advantages and the know-how on how to access international markets, thus reducing the risks and costs associated with entering export markets.

6.4 Conclusion

In this chapter we have assessed the extent of technology use, provision of formal training, and exporting activity undertaken by foreign firms in relation to domestic firms. This assessment has been undertaken to explore whether foreign firms are more likely to employ modern technology in production, provide formal training to workers and be engaged in exporting activity compared to domestic firms.

Using a combination of own survey data and other data on Ghanaian manufacturing, we find that it is difficult to answer adequately the question on the use of modern technology in production, precisely because the measurement for technology use is not uniform across the various surveys. However, based on data from the World Bank Enterprise survey, we found that the proportion of foreign firms using foreign licences in production is higher than that for domestic firms. This finding is only indicative of what may be happening with respect to technology use in production, because the number of foreign firms in the sample is very low relative to domestic firms.

We however find that foreign firms are more likely to provide formal training schemes in which workers and management are trained compared to domestic firms. Furthermore, we also find that foreign firms are more likely to export compared to domestic firms. Given that foreign firms are more likely to provide formal training schemes, it is conceivable that some degree of technology transfer might be taking place. However, it is impossible to estimate precisely the extent to which this is occurring, given the inadequacy of information on the subject. In this regard further work is needed especially on obtaining accurate information from detailed firm-level studies, which can shed light on the types of formal training schemes available to workers, the form and content of these training schemes and the mechanisms by technology transfer occur.

Chapter 7

Assessing the Exporting Behaviour of FDI Firms

7.0 Introduction

In the preceding two chapters we first discussed the characteristics of FDI firms from our survey, primarily focusing on some important firm-specific characteristics as well as the general economic environment in which these firms operate. Subsequently, we explored the extent to which FDI activity in the manufacturing sector involves the international transfer of technology using our own survey data. In the preceding chapter, we compared the technology-related activities of FDI manufacturing firms with those of domestic firms. We also examined whether FDI manufacturing firms were more likely to provide formal training for their workers and be more export-oriented compared with domestic firms. In this chapter, our principal objective is to examine in a bit more detail the exporting behaviour of FDI firms in relation to certain firm-specific characteristics using data from our survey. However, it is worth stating at the outset that data limitations do not permit the use of more rigorous analytical techniques to examine the exporting behaviour of FDI firms. However, before we proceed with our analysis, we first present a brief review of the literature on the relationship between FDI and exports.

7.1 The Relationship between Foreign Direct Investment and Exports

This section presents a brief review of the theoretical and empirical literature on the relationship between inward FDI and goods trade (exports). Earlier, in Chapter 2, we noted that initial theoretical efforts to examine the relationship between FDI (more appropriately capital flows) and goods trade (exports) can be traced to the seminal work

of Mundell (1957). His work examined the consequences on the direction of trade within the standard Hecksher-Ohlin-Samuelson trade model when cross-border capital movements occur due to the imposition of tariffs in any one country (in a two-country world). His findings show that capital mobility serves as a substitute for trade; capital thus substitutes for the exports from the capital-recipient country. Subsequent to the work by Mundell, many theoretical efforts were focused on establishing whether capital flows (FDI) and exports are substitutes or complements; the conclusions suggest the absence of any unambiguous relationship between FDI and exports. Table 7.1 presents a summary of the relationships between capital flows (inward FDI) and goods trade (exports) suggested by the theoretical literature, although the examples cited here do not represent an extensive survey of the literature.

Table 7.1: Summary of Main Findings from Theoretical Literature Survey

Author(s)	**Publication Year**	**Economic Framework, and Assumptions and/or Conditions**	**Relationship between FDI and Exports**
Robert Mundell	1957	H-O-S model; Impediments (tariff) to trade and factor movements; Only capital migrates	Substitutes
Olivera	1967	H-O-S; Labour mobility	Substitutes
Rakowski	1969	H-O-S; Labour migration	Substitutes
Nadel	1971	H-O-S; Capital and Capital Services migrate	Substitutes
Flatters	1972	H-O-S; Capital owners are allowed to migrate with capital	Substitutes
Falvey	1976	H-O-S; impediments (tariff) to trade; capital only mobile factor	Substitutes
Melvin	1989	H-O-S; Trade in factor services instead of capital	If only labour-intensive good tradeable, then Substitutes. If only capital-intensive good tradeable, then Complements
Neary	1995	Specific-factors model; capital only mobile factor; impediments in the form of tariff; importance of factor intensities	Substitutes
Schmitz and Helberger	1970	Spatial equilibrium; different production technologies; distinguish types of manufacturing activities; capital only mobile factor	Complements
Purvis	1972	H-O-S; different production technologies, capital only mobile factor	Complements
Melvin	1969	H-O-S; increasing returns to scale; capital only mobile factor	Complements
Wong	1983	H-O-S; different production technologies; two scenarios regarding factor mobility –	If there is labour mobility and free trade, specialisation, trade pattern based on H-O-S.

		labour mobility and free trade, and capital mobility and free trade	If there is capital mobility and free trade, possible Complementary relationship
Markusen	1983	H-O-S; different production technologies; production taxes uncompetitive market; external economies of scale; factor market distortions; capital only mobile factor	Complements
Svensson	1984	Specific-Factors model; cooperative and non-cooperative relationship between capital and labour; capital only mobile factor	If capital and labour are cooperative, then factor movements and trade are Substitutes. If capital and labour are non-cooperative, then factor movements and trade are Complements.
Wong	1986	H-O-S; differences in factor endowments, preferences and production technologies	If economy is specialised in the capital-intensive good then Complements. If economy is specialised in the labour-intensive good then Substitutes
Krugman	1979	New trade theory; monopolistic competition; internal economies of scale; labour the only mobile factor	Relationship between factor movement and goods trade Complements
Markusen and Venables	1998	New trade theory with multinational activity introduced.	Movement of factors via multinational activity is to increase trade; a complementary relation
Pontes	2004	New trade theory; combining both horizontal and vertical FDI models; incorporates notion of upstream and downstream production	If part of downstream production takes place in foreign country, substitutes. If entire downstream production takes place in foreign country, complements

Source: Author's compilation

Moreover, the relationship between FDI and exports can also be influenced by the motivation behind FDI projects, thus giving rise to the distinction between vertical and horizontal FDI. In the case of vertical FDI, the relationship with exports is positive (complements) because this type of FDI usually takes place where countries possess dissimilar characteristics (especially in factor intensities), such as between developed and developing countries. On the other hand, horizontal FDI occurs where MNEs aim to extend their activities to countries with growing markets and therefore establish affiliates in those countries. Consequently, it is usually the case that FDI substitutes for exports because affiliate production now serves the host markets. The latter is expected

where countries have similar characteristics, although this may not always be the case. In other words, where FDI is marketing-seeking it is expected that the relationship will be negative (i.e., substitutes) and be complements where it is efficiency-seeking or of the vertical FDI type (Neary 2008; Helpman et al. 2003; Yeaple 2003; Gray 1998; Markusen and Venables 1998). Besides, the *proximity-concentration hypothesis* shows that higher trade barriers and transport costs resulting in higher transaction costs lead to horizontal cross-border expansion of firms to access markets; thus, FDI and exports become substitutes (Brainard 1997).

Another type of FDI – export platform FDI – has emerged in recent years, in which the motivation behind MNE investment is to export to third markets rather than produce for the host market or export to the home country (Ekholm et al. 2003; Helpman et al. 2003; Neary 2002). In these models that explain why MNE affiliates serve as *export platforms*, the use of affiliates as export platforms is feasible when the gains from avoiding transport costs outweigh the costs associated with maintaining capacity in multiple markets. Consequently, it is impossible to determine a priori whether the relationship between FDI and exports would be complementary or otherwise. Closely related to the motivations behind FDI, the product life-cycle theory by Vernon (1966) also provides a guide as to whether FDI and exports would be complements or substitutes. It is expected that at the early stages of cycle the two would be substitutes (because FDI seeks new markets in the host country) whilst at the mature stage they will be complements (because FDI is both efficiency-seeking as well as staving off competition from rivals in the market). Moreover, the internalisation theory of FDI (Buckley and Casson 1976; Hennart 1982) suggests that FDI substitutes for exports. Thus in the absence of any a priori relationship between FDI and exports predicted by theory, the degree of complementarity or otherwise between the two (FDI and exports) remains an empirical question.

The empirical analyses of the relationship between FDI and exports have thus been influenced by the nature of the theoretical debate. Consequently, emphasis has been placed largely on exploring the bivariate relation between the two, that is, whether they are complements or substitutes, and in determining whether the direction of causation runs from FDI to export or vice versa. Moreover, because most of these studies rely on aggregate-level data, empirical studies can be divided into country-level, industry-level and firm-level studies. Furthermore, the empirical investigations into the FDI-export nexus have also encountered problems relating to the possibility of bi-

directional causality. This is because it is also possible to expect that growth in exports would result in increased FDI inflows to a country. This possibility has been suggested by Won et al. (2008: 39), who argue that exports could trigger FDI inflows to a country. This occurs where "expanding exports pave the way for FDI because of a reduction in transaction costs for foreign investors through the knowledge of host country's market structure". Moreover, Won et al. (2008: 43) observe that "the causality relations would vary with the period of study, the econometric methods used, treatment of variables (nominal and real), one-way regression or two-way causality, and the presence of other related variables or inclusion of interaction variables in the estimation equation". Table 7.2 presents a summary of a few of the empirical studies on the relationship between FDI and exports.

Table 7.2: Summary of Empirical Literature Review

Author(s)	Year	Study Area and Main findings
Bowen et al	1998	European community; Goods and factor (labour migration) are substitutes but goods and financial flows (proxy of FDI) complements
Goldberg and Klein	1997	Latin America and Southeast Asia; FDI from Japan stimulates imports whilst FDI from USA discourages imports particularly in Asia. In terms of exports, complementary relationships are observed for FDI from both Japan and USA.
Collins et al	1997	Historical analysis of new world and old world countries; Significant ambiguities are observed as far as the relationship is concerned. 60 percent of correlation tests reveal no significant relations, while in the remaining 40 percent, majority indicated complementarity. There is no support for substitutability although complementary relationship observed in regression is insignificant
Goldberg and Klien	1999	FDI from USA to Latin America; Heterogeneous effects of FDI. Outcome of relationship depends on sector. Complementarities generally observed within manufacturing.
Pain and Wakeline	1998	11 OECD countries; Also observe significant heterogeneous effects. There is generally the absence of systematic variation between FDI and trade, though in general evidence points to complementarity.
Zhang	2006	On China; Strong correlation between exports and FDI. Obvious complementarity established from regression estimation.

Source: Author's Compilation

7.2 The Impact of FDI on Exports in Host Developing Countries

For developing countries that are heavily dependent on agricultural and resource-based exports the possibility of leveraging FDI for export promotion, particularly manufactured exports, is one of the most important benefits that can be obtained from the active promotion of FDI. This is because MNEs are thought to possess firm-specific advantages in accessing export markets due to superior marketing knowledge as well as the extensive distribution and marketing networks of which MNEs play a very major part. Thus, the presence of MNEs is expected to provide the platform from which host countries can expand exports and eventually increase export competitiveness. Consequently, in the last two decades empirical analyses of the relation between FDI and exports have focused largely on the benefits to be derived by host countries in terms of the export performance of domestic enterprises. As Lall (2000) notes, export success has become increasingly linked to FDI, although this success depends on the attraction of more and better FDI. Nonetheless, what is most important in our view is whether FDI firms engage in direct export activities. This is because the export activities of FDI firms have important implications in respect of the potential export spillovers to the rest of the economy; spillovers which if effectively harnessed can provide the basis for developing countries to expand and diversify their exports away from natural resources. In this section we present a brief review of the empirical literature on the impact of FDI on host countries' exports.

Conceptually, Zhang and Song (2001) distinguish the effects of inward FDI on host countries' export performance into direct and indirect effects. The direct effects consist of the following: (a) processing of local raw materials, (b) exports of labour-intensive final products, and (c) labour-intensive processes and component specialisation within vertically-integrated international industries. Thus, the *direct effects* in terms of exports can be regarded as those first-hand activities undertaken by MNEs in host countries that result in export expansion or export diversification. Hence, the export activities of MNEs or their affiliates constitute direct effects. On the other hand, the indirect effects, as we have discussed previously in Chapter 2, fall within the category of spillovers arising from the presence of MNEs in an industry/sector. In other words, indirect effects arise because MNEs can affect host country exports through several indirect channels. Thus, domestic firms can acquire exporting knowledge by observing the export activities of MNEs or their affiliates (i.e., learning by watching/observing) and subsequently begin to export in the future. Aitken et al. (1997)

for example argue that proximity to MNEs increases the likelihood of domestic firms exporting due to informational spillovers arising from the specific activities of MNEs in areas such as overseas customers, distribution and technology. Another channel by which domestic firms can enhance their export potential include backward and forward linkages with export-oriented FDI firms that permit domestic firms to acquire the necessary know-how in product and process technology as well as management and marketing competences.

The empirical analyses of the effect of FDI on exports, particularly manufactured exports, have largely focused on the indirect effects. Thus, most studies focus on estimating the export-spillover effects of FDI in host countries. These studies are generally carried out at the industry and/or firm level and thus rely on firm-level data obtained from industrial censuses and/or firm-level surveys. The main objective of these impact studies is to examine whether the FDI-specific assets, such as superior knowledge of production and management and advantages in accessing export markets do indeed lead to an increase in the export performance of domestic firms (because they spillover to these domestic firms). The evidence on the impact of FDI on the export performance of domestic firms (export spillovers) has been mixed and also very limited. Moreover, there are a few case studies that provide support for export externalities in developing countries, such as that presented in the review of eleven low-income countries by Rhee and Bélot (1990). Some studies (Kokko et al. 2001; Alvarez and Lopez 2008) have found evidence of positive export spillovers, whilst others, such as (Aitken and Harrison 1999; Djankov and Hoekman 2000; Chudnovsky and Lopez 2004; Kumar and Siddharthan 1994) have found evidence of negative spillovers. These studies have usually employed various econometric methods to estimate the export behaviour of domestic firms in the presence of foreign firms.

Whilst the empirical discussion on the impact of FDI on exports in host developing countries has focused on determining whether export spillovers exist, very little evidence has been provided in respect of the export activities arising directly from FDI firms in SSA countries. In subsequent sections, we present evidence from our survey data on the exporting activities of FDI firms in Ghana and also investigate which firm-specific characteristics are influential in the export-orientation of FDI firms.

7.3 The Exporting Behaviour of FDI Firms

Our emphasis on the direct export activities of FDI firms implies that we rely on firm-specific characteristics to determine the extent to which these are associated with their exporting behaviour. Specifically, we examine whether the firm size, the source of FDI, and other activities related to technology transfer are associated with exporting behaviour. We have already noted in Chapter 5 that most of the data collected from the survey is nominal and categorical in nature, which therefore limits much of our analysis to the use of non-parametric statistics. Thus, we are unable to examine whether causal relationships exist between a firm's exporting behaviour and firm-specific characteristics. Nonetheless, with categorical data we are able to determine whether significant differences exist between exporting behaviour and firm-specific characteristics; in other words, we test for association between exporting behaviour and firm-specific characteristics using the Chi-square test. In addition, we also conduct a probit analysis to determine whether any observed association between firm-specific assets and export-orientation of FDI firms based on the Chi-square test can be supported.

Before examining exporting behaviour of FDI firms in detail, we begin by briefly exploring possible relationships among a few important firm characteristics using simple cross-tabulations. The objective is to find out if any patterns emerge from the characteristics of FDI firms.

7.3.1 Exploring Patterns among Important Characteristics of FDI Firms

In most empirical studies where survey data are used, there is usually an interest in examining the patterns of behaviour among a number of variables of interest. In this section we focus on a few of these; the source regions of FDI, the sub-sectors of the manufacturing sector in which FDI firms operate and the size of firms. To examine the existence of any patterns among these important variables, we rely on contingency tables or cross-tabulations. The contingency tables usually reveal better relationships and patterns in nominal and categorical data compared to proportions and percentages, and usually provide the first indications of any meaningful patterns and relationships in the data.

7.3.1.1 FDI Source Region and Manufacturing Sub-Sector

Our first interest is to explore whether FDI projects from particular regions – broadly defined as developing and developed – are attracted to specific industry groups in the manufacturing sector. It is worth stating at the onset that there are certainly several factors that influence the decision to undertake a particular investment project in any sector of any economy, and our analysis here does not aim to address the underlying motivations behind investment projects in the manufacturing sector. Nonetheless, our attempt here is only to explore whether there exists any patterns in FDI projects in terms of manufacturing sub-sector and FDI source regions. In this regard we present a cross-tab for FDI projects from developing and developed regions and the eight (8) sub-sectors of manufacturing in Table 7.3. The developed region here consists of Europe and USA, whilst the developing region consists of China, India, Africa, Middle East and South East Asia.

Table 7.3 shows that the majority of FDI projects are from the developing region; approximately 59 percent of all FDI projects are from this region. Nonetheless, we also find that nearly three-quarters of FDI projects in the Food, Beverages and Tobacco sub-sector originate from the developed region. The other sub-sector in which investments from the developed region is dominant is Non-Metallic Mineral. In the Wood and Furniture sub-sector there is an even split of investment projects between developed and developing regions.

Table 7.3: FDI Source and Manufacturing Sub-Sector

Manufacturing sub-Sector	FDI Source Region	
	Developing Region	Developed Region
Food, Beverages and Tobacco	26.3%	73.7%
Textiles and Leather Products	85.7%	14.3%
Wood and Furniture Products	50.0%	50.0%
Paper, Printing and Publishing	100.0%	---
Chemicals, Plastics and Rubber Products	75.0%	25.0%
Non-Metallic Mineral Products	33.3%	66.7%
Basic Metals and Fabricated Metal Products	88.9%	11.1%
Manufacture of Machinery and Other Equipment	75.0%	25.0%
Total	59.4%	40.6%

Source: Author's Computation from Own Survey Data

Investment projects from the developing regions are dominant in the Textiles and Leather products; Paper, Printing and Publishing; Chemicals, Plastics and Rubber; Basic Metals and Fabricated Metal products; and Manufacture of Machinery and Other Equipment sub-sectors.

Why are investments from the developed region dominant in the Food, Beverages and Tobacco and Non-Metallic sub-sectors, whilst FDI from the developing region is dominant in sub-sectors, such Chemicals and Plastics and Textiles and Leather? The reasons we put forward in explaining the observed patterns are only based on observations made during the fieldwork and other anecdotes; the reasons provided are therefore suggestive.

In the Food and Beverages sub-sector, we observed the presence of large multinationals, such as Coca-Cola, Nestle, Cargill, Barry Callebaut, and Archer Daniels Midland (ADM) Company, who are actively involved in the Ghanaian economy. With the exception of Coca-Cola, these firms are engaged in cocoa purchasing and processing, as well as the production of cocoa products for sale in Ghana and worldwide. The attraction of these firms to the Food and Beverages sub-sector is thus on account of Ghana being an important producer of cocoa. But this is also because the international market for cocoa production and processing is dominated by multinational enterprises, many of which are headquartered in Europe and North America. These multinational firms have become an important part of the trade in commodities and in some situations created what have been termed the *international commodity chain* because of their control or part ownership of plantations, production plants, and distribution outlets.[57] Another factor that may account for the dominance of firms from the developed regions in the Food and Beverages sub-sector is the long historical and trade links between the Gold Coast (now Ghana) and Europe that commenced in the years after European explorers had first made their journeys to Africa.

The Non-Metallic sub-sector is dominated by firms engaged in cement production, such as GHACEM, which is part of the HeidelbergCement group, and the production of concrete products as well as other firms engaged in the production of finished granite, marble, limestone and other ceramic products for the domestic market.

[57] The concept of the Global Commodity Chain analysis was introduced by Gereffi and Korzeniewicz in the mid-1990s, and developed within the framework of World Systems Analysis (or the political economy of development and underdevelopment). See also Gereffi (1994) and Gereffi et al (2005) for more on this.

Most of these firms are European in origin and have been operating in Ghana to take advantage of the growth in the real estate sector and the construction of other general infrastructure projects, such as roads.

With regard to FDI projects originating from developing regions, we observed that they are dominant in the following sub-sectors: Paper, Printing and Publishing; Basic Metals and Fabricated Metals; Textiles and Leather; Manufacture of Machinery and Other Equipment; and Chemicals, Plastics and Rubber. The main sources of investments projects are China, India, Nigeria and Lebanon. For example, we find that Chinese investments are dominant in the Textiles and Leather sub-sector, whilst Indian investments are dominant in the Chemicals and Plastics sub-sector (see Table 7.4, which provides a breakdown of the broad geographical regions into smaller regions and countries).

Table 7.4: Manufacturing sub-Sector by Source Countries/Regions of FDI

Manufacturing sub-Sector	FDI Source Region						
	Africa	China	Europe	India	Middle East	S. East Asia	USA
Food, Beverages and Tobacco	---	---	68.4%	10.5%	15.8%	---	5.3%
Textiles and Leather Products	---	57.1%	14.3%	28.6%	---	---	---
Wood and Furniture Products	---	16.7%	50.0%	---	---	33.3%	---
Paper, Printing and Publishing	---	50.0%	---	---	---	50.0%	---
Chemicals, Plastics and Rubber Products	---	6.3%	6.3%	43.8%	18.8%	6.3%	18.8%
Non-Metallic Mineral Products	---	33.3%	66.7%		---	---	---
Basic Metals and Fabricated Metal Products	---	22.2%	11.1%	33.3%	33.3%	---	---
Manufacture of Machinery and Other Equipment	50.0%	---	25.0%	---	---	25.0%	---
Total	2.9%	15.9%	34.8%	20.3%	13.0%	7.2%	5.8%

Source: Author's Computation from Own Survey Data

Are there any reasons why FDI from the developing regions is dominant in these sectors? Although we have no cogent explanations for the dominance of FDI originating from the developing regions in these sub-sectors, our observations from fieldwork suggest that the production technology in these firms can be classified as ranging from medium to high, though not sophisticated.[58] It was apparent that in several of these firms, manufacturing activity relied on fairly modern machinery. Nonetheless, a better understanding of the industry-location decisions of foreign investors can only be the subject of further research into explaining the factors determining investment decisions of foreign investors.

7.3.1.2 Firm Size and Manufacturing Sub-Sector

Following on from our discussion on FDI source by manufacturing sub-sector, we explore whether some sub-sectors in the manufacturing sector are likely to be dominated by large or small and medium sized firms. In Table 7.5 we present information on the distribution of firm size by manufacturing sub-sector. We observe that the scale of plants is very important in the Food, Beverages and Tobacco because very large-sized firms are dominant in that sub-sector. This confirms our observations from the fieldwork, where our visits to firms engaged in food and beverage production tended to be very large, and operate with large scale plants. There are however small- and medium- and large-sized firms that also operate in the sub-sector. In the Chemicals, Plastics and Rubber sub-sector we find that the distribution of firms by size is fairly equal across firm size classification. Nonetheless, large-sized firms appear to be the dominant ones in the sub-sector.

On the other hand, we observe a complete absence of very large-sized firms in the Wood and Furniture, and Paper, Printing and Publishing sub-sectors, although in the Wood and Furniture sub-sector the dominant firms are large-sized firms. Large-sized firms are also dominant in the Basic Metals and Fabricated Metal products and Machinery and Other Equipment sub-sectors. The only sub-sector where small- and medium-sized firms are dominant is that of Non-Metallic products.

[58] This classification is entirely arbitrary and not based on any objective measure of production technology in firms.

Table 7.5: Manufacturing sub-Sector by Firm Size

Manufacturing sub-Sector	Firm Size Classification		
	Small & Medium	Large	Very Large
Food, Beverages and Tobacco	10.5%	21.1%	68.4%
Textiles and Leather Products	42.9%	42.9%	14.3%
Wood and Furniture Products	33.3%	66.7%	---
Paper, Printing and Publishing	50.0%	50.0%	---
Chemicals, Plastics and Rubber Products	25.0%	37.5%	37.5%
Non-Metallic Mineral Products	66.7%	16.7%	16.7%
Basic Metals and Fabricated Metal Products	33.3%	55.6%	11.1%
Manufacture of Machinery and Other Equipment	25.0%	50.0%	25.0%
Total	29.0%	37.7%	33.3%

Source: Author's Computation from Own Survey Data

7.3.1.3 Firm Size and FDI Source

We have explored the relationships between source region of FDI projects, manufacturing sub-sector and firm sizes. We now explore firm size and FDI source. Are large-sized firms more likely to originate from developed regions? And are small-sized firms more likely to originate from developing regions? In Table 7.6 we present the distribution of firm sizes by FDI source. We find that in the category of the large sized firms, European, Indian and USA investments dominate. For firms classified as large, investments from Europe and India are again prominent, although we also find that Chinese and Middle Eastern firms are also well represented. In the category of small- and medium-sized firms, we find that the firms of Chinese origin are dominant, although as in the case of the large-sized category, there is a fair representation of firms from other regions, except Africa.

On the whole however, we find that European, Middle Eastern and Indian firms are present in all the three firm size categories. The relatively large presence of firms of European and Indian origin across the three firm size categories can be attributed to the longstanding trade and cultural links between Ghana and Europe, and between Ghana and India, much of which pre-dates independence. In recent years we have witnessed a surge in Chinese investments in Ghana, although in the years and decades ahead, we expect to see changes in the pattern of investment projects depicted in Table 7.6

Table 7.6: Firm Size by FDI Source Region

FDI Source Region	Firm Size Classification		
	Small & Medium	**Large**	**Very Large**
Africa	---	3.8%	4.3%
China	30.0%	19.2%	---
Europe	20.0%	23.1%	60.9%
India	15.0%	23.1%	21.7%
Middle East	20.0%	15.4%	4.3%
S E Asia	10.0%	11.5%	---
USA	5.0%	3.8%	8.7%
Total	**100.0%**	**100.0%**	**100.0%**

Source: Author's Computation from Own Survey Data

To summarise our observations so far, we note that although the majority of FDI firms originate from the developing region, European FDI is the predominant form of investment among those originating from the developed region, and is more likely to be located in the Food and Beverage sub-sectors. European investments are also more likely to be large or very large in size. In the case of investments from the developing region, Indian FDI is predominantly located in the Chemicals and Plastics sub-sector, whilst Chinese investments are more likely to be located in the Textiles and Leather sub-sectors. Indian investment are however likely to be larger in size compared with Chinese investments.

7.4 Further Analysis of Exporting Behaviour by FDI Firms

We have noted earlier that the relationship between foreign direct investment and exports has received attention in the academic literature. On one hand, several empirical studies (such as, Nair-Reichert and Weinhold 2000; Hsiao and Hsiao 2006) have focused on the direction of causality between exports and foreign direct investment using aggregate-level data. On the other hand, there have been studies using micro-level data to explore the export-spillover effects of FDI in host countries. Besides, other studies that have investigated the exporting behaviour of firms in general have also focused on the influence of ownership (especially foreign ownership) among several other factors in determining the export-orientation of firms. In general, it is

expected that firms that are foreign-owned are more likely to export compared with domestic firms. This is because foreign firms operating in host developing countries are more likely to export than domestic firms because of certain firm-specific assets identified earlier in this chapter. Consequently, several studies examining the exporting behaviour of firms (such as, Rankin et al. 2005; Bigsten et al. 1999a, 2000, 2002, 2004) have included a measure of FDI to test this hypothesis with varying outcomes on the impact of ownership on export behaviour.

In contrast to these studies, our objective in this section is to explore in detail the exporting behaviour of FDI firms using simple charts, and the Chi-square statistic to assess whether there is association between exporting behaviour and certain firm-specific characteristics, However, any associations we find do not inform us about the structure of the underlying causal relationships between exporting behaviour and firm-specific characteristics. For robustness, a probit econometric analysis is conducted to verify the already observed relationship between export-orientation and firm-specific characteristics. This therefore provides the basis to make firm conclusions on the relationship between firm-specific characteristics and the export-orientation of FDI firms. We recognise that the export decisions of firms involve a complex process of interactions among several firm-specific and exogenous variables. These would include the following: (a) firm-specific characteristics, such as size, industry (product group), and intellectual asset-base (e.g., managerial and marketing capacity etc.), and specific firm activities, such as the ability of firms to establish and maintain linkages with overseas markets (end-use producers or consumers) and innovative activities (defined as the development and deployment of new products and production processes) and (b) exogenous conditions, such as national macroeconomic environment, the rules governing the international/export markets, international regulations governing trade between countries and between firms, national regulations regarding the behaviour of firms and industrial clusters as well as industry conditions, such as the presence or absence of external economies. However, data limitations do not permit a detailed examination of the causal factors underlying the exporting behaviour of FDI firms.

In Chapter 5, we briefly described the exporting behaviour of FDI firms. We found that approximately 55 percent of FDI firms were exporting at least 1 percent of their total sales. Moreover, where exporting behaviour of FDI firms was defined as at least 10 percent of exports in total sales, this percentage dropped marginally to 54 percent. In this section we first present detailed descriptive statistics on the exporting

behaviour of FDI firms from 2005 to 2008. This is then followed by an examination of exporting trends among firms that exported. Although the data available are cross-sectional, we attempt to discover patterns of behaviour regarding firms that enter, leave or remain in the exporting business. It is important to note here that firms were not asked detailed questions about why and what makes them export, or what accounts for any lack of exporting activity in a particular year. However, we are able to extract a pattern of entry and exit of FDI firms regarding exporting behaviour with the use of simple graphs generated from responses to questions on the percentage of sales exported for each year of the 4 years for which information was request.

Table 7.7 reports summary statistics on the exporting behaviour of FDI firms from 2005 to 2008. The first row reports the number of firms exporting for each year, with the percentages reported in parenthesis. Over the period the number of firms exporting increased from 46.4 percent in 2005 to 55.1 percent in 2008. We also observe that on average the proportion of total sales exported by firms increased over the period. This is illustrated by the increases in the mean, median and mode for the reported percentage of sales exported by firms. The variation around the mean also rises over the three years.

Table 7.7: Summary Statistics on Exporting Behaviour of FDI Firms, 2005-2008

	2008	**2007**	**2006**	**2005**
Number of Firms Exporting	38 (55.1%)	36 (52.2%)	35 (50.7%)	32 (46.4%)
Mean of Percentage of Sales Exported	45.71	42.78	37.00	32.81
Std. Error of Mean	4.012	3.894	3.814	3.781
Median of Percentage of Sales Exported	40.00	40.00	30.00	30.00
Mode of Percentage of Sales Exported	40	40	30	20
Std. Deviation	24.729	23.367	22.561	21.391
Variance	611.509	546.006	509.000	457.577
Skewness	.617	.760	.909	1.468
Std. Error of Skewness	.383	.393	.398	.414
Kurtosis	-.059	.579	1.232	3.160
Std. Error of Kurtosis	.750	.768	.778	.809
Range	97	97	99	98
Minimum Percentage of Sales Exported	3	3	1	2
Maximum Percentage of Sales Exported	100	100	100	100

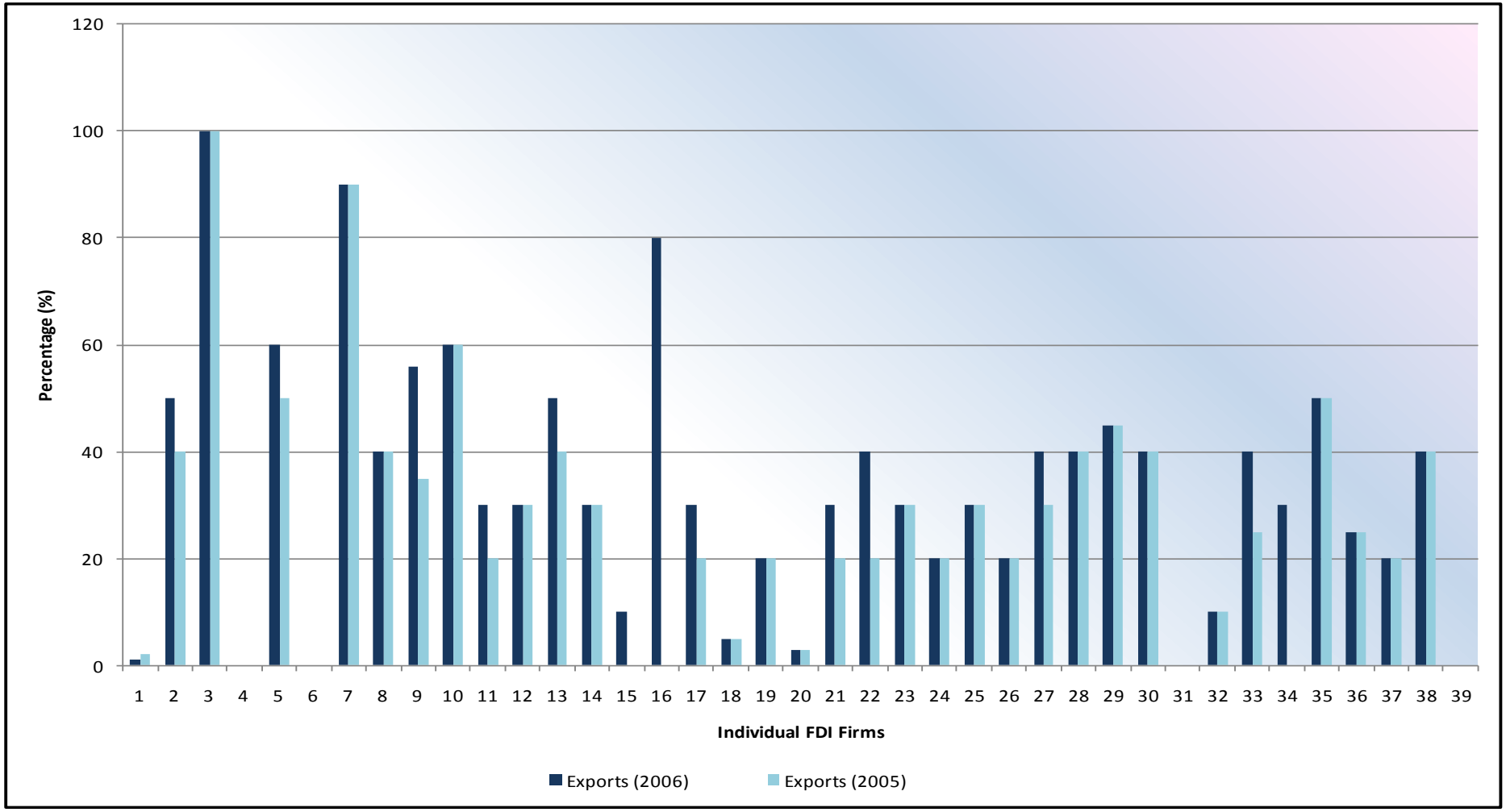
Source: Author's Computation from Own Survey Data

On the face of it, the information on the number of firms exporting will suggest an increase in the number of firms exporting between 2005 and 2008. However, the information in Table 7.7 does not reveal any dynamics regarding the behaviour of FDI firms with regard to entry and exit from the export market, hence a conclusion that the exporting behaviour has improved over the years will be misleading. To explore this apparent improvement in exporting behaviour further, we match information on export activity for each firm from 2005 to 2008 against the year of establishment. In that way, we are able to determine which firms had exported consistently since their establishment and when they began exporting, assuming they were established after 2005. The outcome of this matching process is presented in Figures 7.1 and 7.2.

Figures 7.1 and 7.2 summarises information on the exporting activity of all FDI firms that exported in any of the years from 2005 to 2008. By ocular observation we are able to determine the number of firms that entered and exited the export market. In Figure 7.1 we illustrate exporting behaviour of FDI firms for 2005 and 2006. We observe that four firms did not export in both years whilst three firms exported in 2006 but not in 2005. This indicates that three firms entered the export business in 2006. A total of thirty-two firms exported in both 2005 and 2006. Of these, twenty-one firms did not report any increase in their exports over the two years. Thirteen firms recorded increases in exports. Only one firm witnessed a decline in its exports; the proportion of total sales exported by this firm was very low, 2 percent in 2005 and 1 percent in 2006. It is therefore not surprising that it eventually exited the export market after 2006.

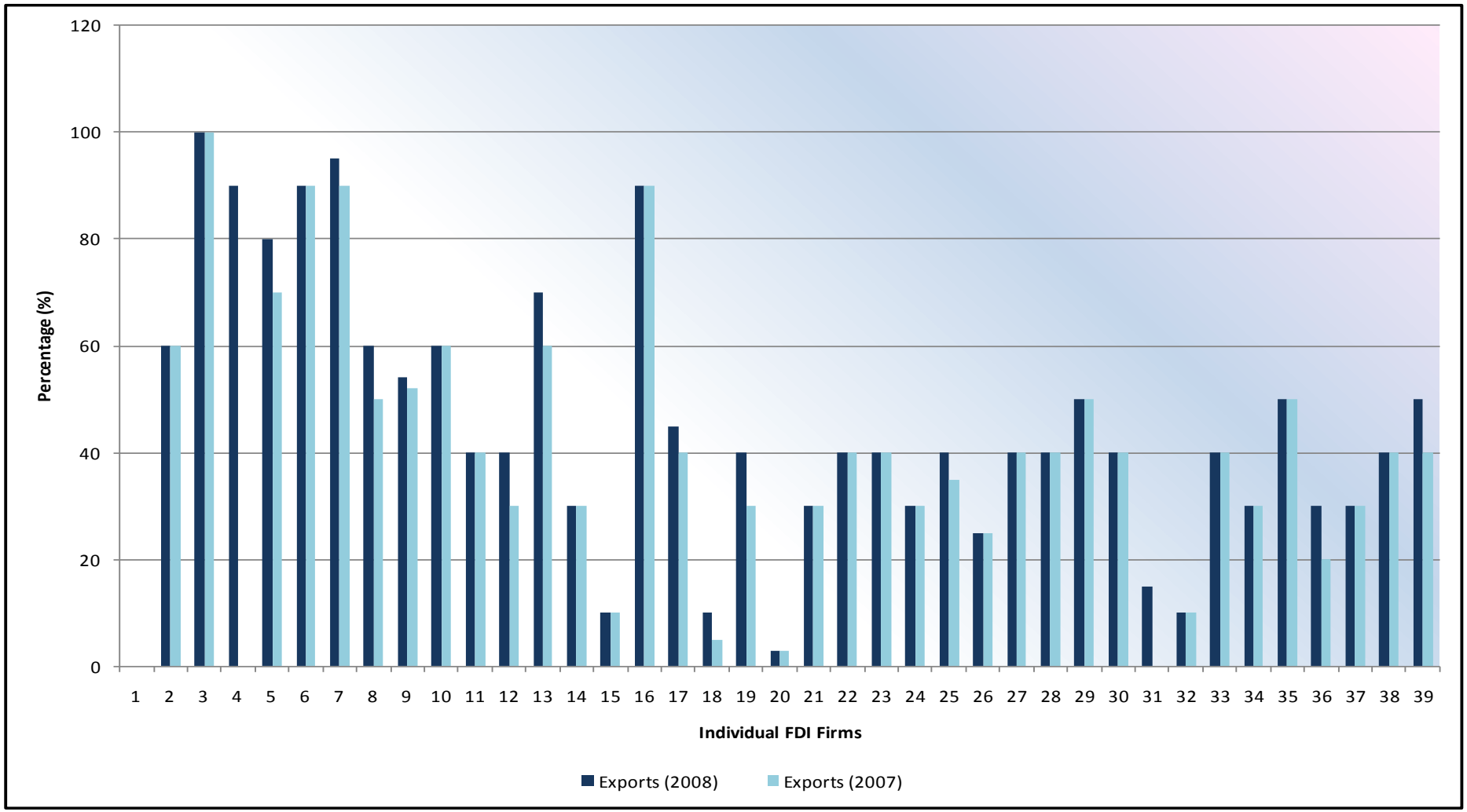
Figure 7.2 reports the exporting behaviour of firms between 2007 and 2008. Using information from Figure 7.1 and 7.2, we observe that between 2006 and 2007 two new firms entered the export business whilst one exited. The total number of firms that exported in both 2006 and 2007 was thirty-three. However, thirty-one FDI firms (45 percent) consistently exported between 2005 and 2007 and also between 2005 and 2008. Only one firm exited the export business (after 2006), whilst three firms entered in 2006, two in 2007, and two in 2008. Thus by 2008, thirty-eight firms were exporting representing 55.1 percent of the total number of firms in the sample. However, on a consistent basis only 45 percent of FDI firms exported since 2005, suggesting that between 2006 and 2008 seven new firms entered the export market.

Figure 7.1: Comparing Exporting Activity for Each Firm that Exported, 2005 and 2006



Source: Author's computation from own survey data

Figure 7.2: Comparing Exporting Activity for Each Firm that Exported, 2007 and 2008



Source: Author's computation from own survey data

What our analysis of the survey data suggests, is that firms with a previous history of exporting were more likely to be exporting in the future, especially when their export volumes are high. The only firm that exited had a very low share of exports in total sales. This provides anecdotal evidence of the presence of what Bernard and Jensen (2001: 5-11) describe as "experience" among FDI firms we surveyed in respect of their exporting behaviour. According to Bernard and Jensen (2001), experience plays a role in the exporting behaviour of firms; the export status of a firm in the present plays a role in the decision to export in the future, so long as there is learning-by-doing in the production of the export good. In short, firms with a history of exporting are more likely to export in the future, and with learning-by-exporting, firms are likely to increase their productivity and thereby their competitiveness in export markets.

However, for firms that do not export, we do not have enough information to posit why they are unable to break into the export market. Moreover, firms that do not export may be motivated by other considerations, such as serving the domestic market. Evidence from the UNIDO survey in Ghana indicates that 65 percent of all foreign investors were motivated by the domestic market in their decision to invest. On the other hand, 20 percent were motivated by regional markets in their investment decisions, whilst 15 percent were motivated by global markets. In the case of foreign investments in the manufacturing sector, the UNIDO survey also reveals 52 percent were motivated by the domestic market; with the remaining motivated either by regional or global markets. These observations are similar to those noted by Wolf (2007) who found in the case of Ghana that firms with more foreign ownership tended to be less export-oriented. These firms, she found, were more interested in serving the domestic market.

The evidence from our survey also indicates that not all FDI firms are export-oriented. Indeed, the motivations behind foreign investments are usually varied, and therefore not all FDI will result in the promotion of export capacity. Moreover, despite the finding that 55 percent of FDI firms reported exporting in 2008, we also found that on a consistent basis from 2005 to 2008 only 45 percent of firms export. Further, we observed in Chapters 5 and 6 that FDI firms were less likely to engage in activities that result in the development of export markets. A significant number appeared to be market-seeking in character, and thus less likely to be involved in the export market.

7.4.1 Exporting and Non-Exporting FDI Firms

Within the literature on exporting behaviour of firms, there is much discussion about the differences between exporting and non-exporting firms (see for example, Bernard et al. 1995; Bernard and Jensen 1999a, 1999b, 1999c; Bernard and Jensen 2001; Clerides et al. 1998). Whilst the comparisons in these studies are done for manufacturing firms in general, our sample has only FDI manufacturing firms. Thus, we compare a few important characteristics exporting of FDI firms and that of non-exporting FDI firms using data on exporting behaviour for 2008. Table 7.8 summarises the observed differences between exporting and non-exporting FDI firms with respect to average age, size, location, sales, source of FDI and manufacturing sub-sector.

We observe that on average exporters are generally older than non-exporters, thus pointing to the role of experience (if we suppose that age is a proxy for experience) in deciding whether firms are able to export or not. We observed earlier that the pattern of export behaviour among exporting firms pointed towards the importance of experience in the ability of firms to remain in export markets. Another concept of what age could represent is general productivity of the firm. As Fafchamps et al. (2002: 1-11) have argued, the age of a firm could capture the general productivity of the firm. In this regard, older firms are able to export as a result of what they describe as 'productivity learning', that is, learning to be productive becomes a prerequisite for exporting. Hence, one would expect exporters to be firms with accumulated years of experience from serving the domestic market before launching into exports. Moreover, they argue that for firms that target export markets at the outset, the proportion of exports in total output will tend to rise as they over time. However, their study on Morocco found that younger firms were more likely to export than older firms, thus finding no evidence of productivity learning among Moroccan manufacturing firms.

Table 7.8: Comparing Exporters and Non-Exporters, FDI Firms

	EXPORTERS		NON-EXPORTERS	
Number of Firms	**38**		**31**	
Mean Age of Firms	**17 years**		**11 years**	
Median Age of Firms	**12 years**		**9 years**	
		(%)		**(%)**
Size Distribution	Small & Medium	25.0	Small & Medium	75.0
	Large	50.0	Large	50.0
	Very Large	87.0	Very Large	13.0
Location Distribution	Greater Accra	50.9	Greater Accra	49.1
	Ashanti	60.0	Ashanti	40.0
	Western	100.0	Western	---
	Central	---	Central	100.0
	Eastern	100.0	Eastern	--
	Northern	---	Northern	100.0
Sales Categories	< $750,000	20.8	< $750,000	79.2
	$750,000 - < $1,500,000	65.2	$750,000 - < $1,500,000	34.8
	> $1,500,000	94.7	> $1,500,000	5.3
FDI Source Region	Africa	100.0	Africa	---
	China	18.2	China	81.8
	Europe	70.8	Europe	29.2
	India	50.0	India	50.0
	Middle East	33.3	Middle East	66.7
	South East Asia	60.0	South East Asia	40.0
	USA	100.0	USA	---
Manufacturing Sub-Sectors	Food and Beverages	68.4	Food and Beverages	31.6
	Textiles and Leather	42.9	Textiles and Leather	57.1
	Wood and Furniture	83.3	Wood and Furniture	16.7
	Paper, Printing & Publishing	---	Paper, Printing & Publishing	100.0
	Chemicals and Plastics	62.5	Chemicals and Plastics	37.5
	Non-Metallic Mineral Products	16.7	Non-Metallic Mineral Products	83.3
	Basic & Fabricated Metals	33.3	Basic & Fabricated Metals	66.7
	Machinery & Equipment	75.0	Machinery & Equipment	25.0

Source: Author's computation using own survey data

We also find that exporters are likely to be large-sized firms, whilst non-exporters tend to be small and medium in size. In Table 7.8, we observe that the proportion of firms in each size category exporting increases with size, suggesting an association between firm size and exporting. Empirical studies on African manufacturing firms (Rankin et al. 2005; Bigsten et al. 1998, 1999b, 2004; Söderbom 2001; Söderbom and Teal 2000, 2001b, 2003; Fafchamps et al. 2002; Teal 1999) indicate that firm size is strongly related to exports, with larger-sized firms are more likely to export than smaller sized firms. We also find that firms with sales turnover in excess of US$1.5 million are more likely to export compared with firms with lower levels of sales turnover. However, we expect that the proportion of sales exported and total sales turnover are likely to be strongly correlated, and therefore this observation is not unexpected.

There appears to be no impact of location on the decision of firms to export. We do not find clear evidence to suggest that firms located in the Greater Accra region will be more likely to export compared to firms located in other regions. It will be expected that proximity to administrative and political institutions, shipping and other port facilities, and operating in a region with relatively good infrastructure will positively impact of FDI firms' exporting behaviour. However, evidence from Table 7.8 does not reveal this pattern of behaviour. On the other hand, firms located in the Western, Eastern and Ashanti regions were more likely to export than those located in other regions of Ghana. But with relatively small sample of firms from these regions it is difficult to explain why this is the case.

Despite the absence of any a priori theoretical expectations regarding FDI source and exporting behaviour of firms, we observe that in Table 7.8 FDI firms originating from Europe, USA, Africa and South East Asia are more likely to export. Firms originating from India were also likely to be engaged in exporting, although an equal percentage was also unlikely to be exporting. In the case of the FDI firms from Africa, our fieldwork interviews revealed that Ghana was chosen as an investment destination in order to serve the West African market. This observation highlights the importance of investor motivations in accounting for exporting behaviour of FDI firms.

With regard to the various manufacturing sub-sectors, we find that firms located in the Food and Beverages, Plastics and Chemicals, Wood and Furniture, and Machinery and Equipment sub-sectors are more likely to be exporters compared with those engaged in other sub-sectors of manufacturing. In a study on the manufacturing sector in five SSA countries Söderbom and Teal (2001a & c; 2003) and Bigsten et al. (1999b) find that in Ghana firms operating in the wood and furniture sub-sector are more likely to be exporters. Regarding the ability of firms to export, Söderbom and Teal (2001a) have argued that in Ghana exports tend to be natural resource dependent, citing as an example the case of wood and furniture exports. But it is apparent from our findings that there is some diversity in the export of manufactures by FDI firms. In the case of the Chemicals and Plastics and Food and Beverages sub-sectors for example, we discovered from our interviews that several firms had began to expand their sales into markets in other West African countries.

7.5 Exploring Relationship between Firm-Specific Characteristics Export-Orientation

In this section we explore the relationship between firm-specific characteristics and export-orientation using categorical data analysis techniques. Given that most of the variables are ordinal or nominal in nature, we rely on non-parametric tests such as the Chi-square test for independence among variables. The main hypothesis underlying the Chi-square test is the absence of any relationship between variables, that is, it tests whether there exists significant differences between an observed number of responses falling into various categories. The objective of the test, therefore, is to determine if any observed relationship in the sample is due to chance. Further, we employ other test statistics to determine the degree of association between variables if any association is confirmed by the Chi-square test. These test statistics are conceptually similar to the correlation coefficient for continuous variables. Prominent among these are the Cramer's phi and Cramer's V (used for larger contingency tables), and the Kendall's tau (tau-b and tau-c). According to Weisberg and Bowen (1977: 153 – 154), the "Kendall's tau measures the extent to which an increase in one variable is accompanied by an increase in another variable (or decrease if the sign is negative)". The difference between tau-b and tau-c, is that "the former is used if there are an equal number of

categories for each of the two variables, whilst tau-c corrects for unequal number of categories for each of the variables". These additional tests to the Chi-square test are generally described as "the effect size, which is a measure of the strength of the relationship between two variables in a statistical population, or a sample-based estimate of that quantity".

Further to the Chi-square tests, and despite the limited information on FDI firms from our survey, we estimate a probit model to determine the relationship between the probability that FDI firms will export to a set of firm-specific characteristics. The dependent variable, export-orientation takes the value one (1) if the firm exports and zero (0) if it does not. In the next section we present the Chi-square test results between exporting behaviour and firm-specific characteristics.

7.5.1 Exporting Behaviour by FDI Source

The contribution of FDI to export growth in host countries has been noted in the work of Aitken et al. (1997) and Greenaway et al. (2004). However these studies assessing the impact of FDI on exporting have relied on estimating export supply functions. Our emphasis in this section is limited to examining simple associations between exporting behaviour and FDI source. This is therefore a slightly different question, as we seek to find out whether investments projects originating from particular areas of the world, are more likely to result in firms exporting. This, however, is not to ignore the fact that the export behaviour of firms is a very complicated process, and that several factors account for why a particular investment project is likely to result in exporting activity; one plausible variable is the source of FDI project.

However what or how do we expect the source region of particular FDI to influence the decision to export? We posit, as a general starting point, that investment projects originating from the developed regions are more likely to be export-oriented compared to investment projects from the developing regions. This is because we expect FDI originating from developed economies to possess modern technology, develop new products, and facilitate access to overseas markets because of superior managerial and marketing capabilities compared to FDI originating from developing countries. This starting point is by itself not a strong point, and therefore only tentative in the sense that FDI from developed regions may be motivated by factors other than to

develop export capacity.[59] Nonetheless, to the extent that FDI firms are thought to possess certain advantages, one of which is knowledge on how to access export markets, we expect FDI from developed regions to be more likely to export.

Tables 7.9a&b report the Chi-square test for exporting behaviour and FDI source, measured as either from a developed or a developing region. All the results are significant at the 5 percent level of significance. The positive value for the Kendall's tau-b suggests that the direction of association is positive but the degree of association is rather moderate. We also find positive statistical association between FDI from the developed region and exporting behaviour of FDI firms (judging by the proportion of FDI within the developed region that exported relative to that from the developing region). Despite the positive association between FDI from the developed region and exporting, assessing the economic significance of this finding is difficult. Nonetheless, given that the degree of the positive association between export behaviour and FDI source is moderate; our argument will be for the need to encourage more export-oriented foreign investments from the developed regions to the manufacturing sector. Furthermore, government policies should aim at encouraging existing FDI firms into the export trade to boost exports of manufactures, with potential spillovers to domestic firms.

Table 7.9a: Exporting Behaviour and FDI Source (Developed/Developing)

		Firm did not Export	Firm Exported	Total
Developing Region	Count	24	17	41
	Expected Count	18.4	22.6	41.0
	% within Developing Regions	58.5	41.5	100.0
Developed Region	Count	7	21	28
	Expected Count	12.6	15.4	28.0
	% within Developed Regions	25.0	75.0	100.0
Total	Count	31	38	69
	Expected Count	31.0	38.0	69.0
	% within Total	44.9	55.1	100.0

[59] It has generally been argued in the literature that particular types of FDI are more likely to result in exporting activity. For example, vertical FDI is more likely to result in exporting because they are predominant in mineral and oil exploitation activities. Other forms of vertical FDI such as those that are part of an international network of value chains is also likely to result in exporting activity. On the other hand horizontal FDI is more likely to be market seeking. A further distinction is made between investments that are part of a multinational group, such as subsidiaries, and those that are not, such as the new versions of FDI SSA. These have been described as foreign entrepreneurs who have no links to multinationals. For these foreign entrepreneurs, it is difficult to predict their motivations, which are likely to be very varied.

Table 7.9b: Chi-square Tests – Exporting Behaviour and FDI Source (Developed/Developing)

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-square	7.563[a]	1	.006		
Continuity Correction[b]	6.268	1	.012		
Likelihood Ratio	7.815	1	.005		
Fisher's Exact Test				.007	.006
Linear-by-Linear Association	7.453	1	.006		
N of Valid Cases	69				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 12.58.

b. Computed only for a 2x2 table

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Nominal by Nominal	Phi	.331			.006
	Cramer's V	.331			.006
Ordinal by Ordinal	Kendall's tau-b	.331	.111	2.958	.003
	Kendall's tau-c	.323	.109	2.958	.003
N of Valid Cases		69			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

7.5.2 Exporting Behaviour by Firm Size

It is generally accepted that firm size plays an important role in the ability of firms to engage in the export business. Theoretically the size of a firm can impact positively on its exporting behaviour. Larger-sized firms can exploit economies of scale, are more likely to easily absorb the huge sunk costs involved in entering export markets, and are also more likely to be productive than small-sized firms. In spite of these possibilities, there are arguments to suggest that small-sized firms can be more productive than large-sized firms (Dhawan 2001), and that the direction of causation between exporting behaviour and firm size is still subject to empirical verification (Fafchamps et al. 2002). Our goal in this section is to assess the level of association

between exporting behaviour and firm size. Tables 7.10a&b report the results of the Chi-square test for export activity and firm size.

The results confirm the presence of a positive association between exporting behaviour and firm size. The Kendall's tau-c also suggests a moderately high degree of association. The results indicate that size plays an important role in the export decisions of firms, with larger firms more likely to export than small sized firms (judging by the higher percentage of firms in the large to very large sized firms that export, relative to those in small and medium sized firms. Although these findings do not suggest any causal relationship between size and exporting behaviour, the positive association is indicative of the importance of size. The findings from our survey add to the existing literature on African manufacturing firms with regard to their exporting behaviour. As previously noted, several studies on African manufacturing have highlighted the significance of size in the export decisions of firms.

Table 7.10a: Exporting Behaviour and Firm Size

		Firm did not Export	**Firm Exported**	**Total**
Small & Medium	Count	15	5	20
	Expected Count	9.0	11.0	20.0
	% within sub-sample	75.0	25.0	100.0
Large	Count	13	13	26
	Expected Count	11.7	14.3	26.0
	% within sub-sample	50.0	50.0	100.0
Very Large	Count	3	20	23
	Expected Count	10.3	12.7	23.0
	% within sub-sample	13.0	87.0	100.0
Total	Count	31	38	69
	Expected Count	31.0	38.0	69.0
	% within Total	44.9%	55.1%	100.0%

Table 7.10b: Chi-square Tests – Exporting Behaviour and Firm Size

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-square	17.030[a]	2	.000
Likelihood Ratio	18.594	2	.000
Linear-by-Linear Association	16.553	1	.000
N of Valid Cases	69		

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 8.99.

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Nominal by Nominal	Phi	.497			.000
	Cramer's V	.497			.000
Ordinal by Ordinal	Kendall's tau-b	.466	.091	5.090	.000
	Kendall's tau-c	.534	.105	5.090	.000
N of Valid Cases		69			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Whilst the obvious economic policy advice will be to encourage large firms into exporting, the predominance of many small- and medium-sized enterprises in Ghana's manufacturing sector calls for innovative policies that will stimulate expansion in the scale of operations of such enterprises. One such option is for government to encourage more export-oriented FDI that generates backward linkages (and where possible forward linkages) with existing small and medium enterprises, with the ultimate objective of improving the level of sophistication in their production, product design, and eventual penetration into export markets.

7.5.3 Exporting Behaviour and Technology Transfer related activities of Firms

In this section we explore if there is any association between exporting behaviour and the technology related activities of FDI manufacturing firms. In the preceding chapter we created two proxy measures to assess the extent of technology transfer by FDI manufacturing firms, that is, the transfer of product and process technology and of skills and technological knowledge. We therefore explore whether there is any association between these technology transfer measures and the exporting behaviour of FDI firms. Further, we also explore whether there any association

between exporting behaviour and activities relating to the development of export markets by firms.

The measure used to assess whether firms engage in activities related to the development of export markets is constructed in a similar way to the other proxy measures of technology transfer. Using responses to the questions on marketing training by firms and the active development of overseas markets, we construct a proxy measure for export market development by firms. This proxy for export market development is a binary variable taking on the value of 1 where the firm provided marketing training for overseas markets and actively works on developing new markets of overseas. Otherwise, the value is zero. This measure indicates that 46 percent of FDI firms engaged in activities related to the development of export markets.

We have noted in the literature review chapter that FDI is generally expected bring about benefits to host countries, such as the introduction of new technology, and also to possess managerial expertise required to access foreign markets. Consequently, our focus in this section is to explore whether there exists any relation between exporting behaviour and activities related to the transfer of technology and the development of export markets. Tables 7.11a&b report the Chi-square test for exporting behaviour and the transfer of product and process technology. The results show the absence of any association between exporting behaviour and the transfer of product and process technology. A similar result is observed in the case of activities related to the development of export markets (reported in Tables 7.12a&b). However, in the case of the transfer of skills and technological knowledge, we find the presence of an association between export behaviour and the transfer of skills and technological knowledge. These results are reported in Tables 7.13a&b.

Table 7.11a: Exporting Behaviour and the Transfer of Product and Process Technology Transfer by Firms

		Firm did not Export	Firm Exported	Total
Firm did not Transfer Product and Process Technology	Count	15	15	30
	Expected Count	13.5	16.5	30.0
	% within sub-sample	50.0	50.0	100.0
Firm Transferred Product and Process Technology	Count	16	23	39
	Expected Count	17.5	21.5	39.0
	% within sub-sample	41.0	59.0	100.0
Total	Count	31	38	69
	Expected Count	31.0	38.0	69.0
	% within Dummy for Technology	44.9	55.1	100.0

Table 7.11b: Chi-square Tests – Exporting Behaviour and the Transfer of Product and Process Technology Transfer by Firms

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-square	.552[a]	1	.458		
Continuity Correction[b]	.249	1	.618		
Likelihood Ratio	.552	1	.458		
Fisher's Exact Test				.476	.309
Linear-by-Linear Association	.544	1	.461		
N of Valid Cases	69				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 13.48.

b. Computed only for a 2x2 table

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Nominal by Nominal	Phi	.089			.458
	Cramer's V	.089			.458
Ordinal by Ordinal	Kendall's tau-b	.089	.120	.744	.457
	Kendall's tau-c	.088	.119	.744	.457
N of Valid Cases		69			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Table 7.12a: Exporting Behaviour and the Development of Export Markets by Firms

		Firm Did Not Export	Firm Exported	Total
Firm did not Engage in Development of Export Markets	Expected Count	16.6	20.4	37.0
	% within sub-sample	40.5	59.5	100.0
Firm Engaged in Development of Export Markets	Expected Count	14.4	17.6	32.0
	% within sub-sample	50.0	50.0	100.0
Total	Expected Count	31.0	38.0	69.0
	% within total	44.9	55.1	100.0

Table 7.12b: Chi-square Tests – Exporting Behaviour and the Development of Export Markets by Firms

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-square	.621[a]	1	.431		
Continuity Correction[b]	.297	1	.586		
Likelihood Ratio	.621	1	.431		
Fisher's Exact Test				.474	.293
Linear-by-Linear Association	.612	1	.434		
N of Valid Cases	69				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 14.38.

b. Computed only for a 2x2 table

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Nominal by Nominal	Phi	-.095			.431
	Cramer's V	.095			.431
Ordinal by Ordinal	Kendall's tau-b	-.095	.120	-.790	.429
	Kendall's tau-c	-.094	.119	-.790	.429
N of Valid Cases		69			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

Table 7.13a: Exporting Behaviour and the Transfer of Skills and Technological Knowledge by Firms

		Firm Did Not Export	Firm Exported	Total
Firm did not provide Formal Training	Expected Count	20.2	24.8	45.0
	% within sub-sample	60.0	40.0	100.0
Firm Provided Formal Training	Expected Count	10.8	13.2	24.0
	% within sub-sample	16.7	83.3	100.0
Total	Expected Count	31.0	38.0	69.0
	% within sub-sample	44.9	55.1	100.0

Table 7.13b: Chi-square Tests – Exporting Behaviour and the Transfer of Skills and Technological Knowledge by Firms

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-square	11.879[a]	1	.001		
Continuity Correction[b]	10.192	1	.001		
Likelihood Ratio	12.745	1	.000		
Fisher's Exact Test				.001	.001
Linear-by-Linear Association	11.707	1	.001		
N of Valid Cases	69				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 10.78.

b. Computed only for a 2x2 table

		Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Nominal by Nominal	Phi	.415			.001
	Cramer's V	.415			.001
Ordinal by Ordinal	Kendall's tau-b	.415	.102	3.918	.000
	Kendall's tau-c	.393	.100	3.918	.000
N of Valid Cases		69			

a. Not assuming the null hypothesis.

b. Using the asymptotic standard error assuming the null hypothesis.

The evidence from Table 7.11a&b, Table 7.12a&b, and Table 7.13a&b suggests that there is no association between exporting behaviour of FDI firms and activities related to the transfer of product and process technology and the development of export markets. On the other hand, we find that there is an association between exporting behaviour and the transfer of skills and technological knowledge. The presence or absence of any relation between exporting behaviour and the measures for technology transfer cannot be readily explained. However, with regard to the lack of association between exporting behaviour and the activities related to the development of export markets, the findings are not entirely surprising. We have earlier observed that many FDI firms were apparently not interested in the development of overseas markets, either through the active development of new markets overseas or providing formal training in marketing techniques needed to service overseas markets to their workers.

But this apparent lack of association between exporting behaviour and the innovative activities of FDI firms may be due to the predominance of firms in the sample that are of the foreign entrepreneur type. The characteristics of these types of investment projects are very different to those of multinational enterprises, which are the predominant forms of investments discussed in the international trade and finance literature. Besides, the theoretical literature on the impact of FDI in host countries is largely focused on the activities of multinational enterprises. These organisations, we have already noted, possess the necessary marketing skills and organisational know-how to operate in export markets that are crucial for the development of export-oriented industries in host countries. Furthermore, these multinational enterprises also control a large part of global trade. Thus, the predominance of FDI firms that are of the foreign entrepreneur type in the case of Ghana probably explains the absence of any association between exporting behaviour and the innovative activities of FDI firms.[60] Nevertheless, the difficulty to measure appropriately innovation and technological activities by FDI firms points to the need for better information and data on these activities as well as on other activities of manufacturing firms that affect their export-orientation, productivity and competitiveness.

[60] FDI firms of the foreign entrepreneur type represented 80 percent of all FDI firms that did not engage in innovative and technological activities.

7.6 Probit Estimation - Exporting Behaviour and Firm-Specific Characteristics

In this section we use the probit model to test the impact of firm-specific characteristics on the decision of FDI firms to export. As previously stated the use of the probit method is to provide further rigorous support to our preceding analysis based on the Chi-square test. Consequently, our discussion in this section is brief and intended to be supplementary. The probit analysis is used due to the dichotomous response to the question on export-orientation (i.e., the dependent variable) which is determined by a set of firm-specific explanatory variables.

Probit models are derived from an underlying latent variable model, where Y^* is an unobserved or *latent* variable, determined by the equation $Y^* = \alpha + X\beta + \varepsilon, \quad Y = 1[Y^* > 0]$ (Wooldridge 2009: 576). In our probit model, the dependent variable, export-orientation is as previously defined hence Y is one if $Y^* > 0$, and Y is zero if $Y^* \leq 0$. α is the constant term, X is the matrix of explanatory variables, β is the vector of coefficients, ε is the error term, which is assumed to normally distributed with mean zero and variance one. The set of explanatory variables (firm-specific characteristics) are defined in Table 7.14 below.

Table 7.14: Firm-Specific Characteristics Affecting Export-Orientation of FDI Firms

Variable	Definition
Firm Size	Measures the size of firm, defined as a categorical variable with the following categories (and values) Small & Medium (1), Large (2) and Very Large (3)
Firm Age	Age of firms measured in years
Firm Age Squared	The square of age of firms to measure the experience or maturity of firms
Technology Dummy	Measures whether firm engages in technological activities, takes the value 1 if yes and 0 otherwise
Marketing Dummy	Measures whether firm engages in developing overseas markets, takes the value 1 if yes and 0 otherwise
Formal Training Dummy	Measures whether firm provides formal training to workers, takes the value 1 if yes and 0 otherwise
Informal Training Dummy	Measures whether firm provides informal training to workers, takes the value 1 if yes and 0 otherwise
Accra Dummy	Measures whether firm is located in Greater Accra region, takes the value 1 if yes and 0 otherwise
Firm Exports (2006)*	Measures previous exporting behaviour/export experience, takes the value 1 if yes and 0 otherwise

*We use exporting behaviour for 2006 because our analysis showed that exporting behaviour for 2007 was almost perfectly correlated with that for 2008.

The choice of these explanatory variables have been informed partly from findings from the empirical literature on the exporting activities of firms in general and partly by our discussions so far on the observed relations (using the Chi-square test) between the export-orientation of FDI firms and firm size, age, previous exporting behaviour, location and the firm-specific assets (technology, marketing, and training) that FDI firms possess. Our preceding discussions suggest that older and large-sized firms are more likely to export compared to younger and small-sized firms. Moreover, we also noted that experience in exporting appears to play an important part in firm's ability to continue to export in the future. On the other hand, we found very little evidence to suggest that proximity to well-developed infrastructure and ports influenced FDI firms' exporting behaviour. Further, other firm-specific characteristics, such as technological activities and development of export markets are not associated with export-orientation, although firms that engage in the provision of formal training (transfer of skills and technological knowledge) were more likely to export.

The probit estimation results are presented in Box 7.1 and 7.2. The results provide strong support for our earlier observation that previous exporting history (experience) and firm size are important determinants in the export-orientation of FDI firms. Further, the statistical significance of age square indicates that firm maturity (a measure for older firms) is also influential in determining the likelihood of firms exporting. Although the marketing variable is significant its sign is negative and might thus point to the possibility that FDI firms were market-seeking. Evidently, the other firm-specific characteristics as well as location do not seem to influence the export decisions of firms. However, given the limited information on all decisions and factors that affect an FDI firm's decision to export, this raises the need for further research in determining the direct exporting activities of FDI firms. Besides, only a better understanding of the exporting behaviour of FDI firms would permit the development of appropriate policies and interventions to leverage the export-spillover benefits of these (FDI) firms to domestic firms in the rest of the economy.

Box 7.1: Probit Results for Exporting Activity by FDI Firms for 2008, using own survey data

```
Iteration 0:   log pseudolikelihood = -47.471471
Iteration 1:   log pseudolikelihood = -16.158725
Iteration 2:   log pseudolikelihood = -12.179324
Iteration 3:   log pseudolikelihood = -11.424803
Iteration 4:   log pseudolikelihood = -11.327474
Iteration 5:   log pseudolikelihood = -11.324139
Iteration 6:   log pseudolikelihood = -11.324133

Probit regression, reporting marginal effects                     Number of obs =     69
                                                                  Wald chi2(9)  =  56.10
                                                                  Prob > chi2   = 0.0000
Log pseudolikelihood = -11.324133                                 Pseudo R2     = 0.7615

------------------------------------------------------------------------------------------------------
                         |               Robust
Firm Exports (2008)      |      dF/dx   Std. Err.      z    P>|z|     x-bar  [    95% C.I.   ]
-------------------------------------------------------------------------------------------------------
Firm Size                |   .3512916   .1383676     2.46   0.014   2.04348   .080096  .622487
Firm Age                 |  -.0660831    .030366    -2.21   0.027   14.4058  -.125599 -.006567
Firm Age Squared         |   .0012345   .0005209     2.43   0.015   361.246   .000214  .002255
Technology Dummy*        |   .0316183   .2325682     0.14   0.891   .565217  -.424207  .487444
Marketing Dummy*         |  -.4168182   .1877649    -2.03   0.043   .463768  -.784831 -.048806
Formal Training Dummy*   |  -.0554141   .1855018    -0.30   0.764   .347826  -.418991  .308163
Informal Training Dummy*|   .2167832   .2062768     1.03   0.305    .84058  -.187512  .621078
Accra Dummy*             |  -.0740154   .2099534    -0.35   0.726   .797101  -.485516  .337486
Firm Exports (2006)*     |   .9313536   .0466913     5.63   0.000   .507246    .83984  1.02287
-------------------------------------------------------------------------------------------------------
obs. P                   |   .5507246
pred. P                  |   .5776034  (at x-bar)
-------------------------------------------------------------------------------------------------------
(*) dF/dx is for discrete change of dummy variable from 0 to 1
z and P>|z| correspond to the test of the underlying coefficient being 0
```

Box 7.2: Further Details on the Marginal Effects and Significance level from Probit Estimates

dprobit

	b	t
Firm Size	0.351	2.54*
Firm Age	-0.066	-2.18*
Firm Age Squared	0.001	2.37*
Technology Dummy	0.032	0.14
Marketing Dummy	-0.417	-2.22*
Formal Training Dummy	-0.055	-0.30
Informal Training Dummy	0.217	1.05
Accra Dummy	-0.074	-0.35
Firm Exports (2006)	0.931	19.95***
N	69.000	

*** Significant at 1 percent, * Significant at 10 percent

7.7 Conclusion

In this chapter we have explored in detail the exporting behaviour of FDI manufacturing firms in Ghana. Our analyses indicate that exporting firms were larger in size, tended to have higher levels of sales turnover, and that firms with previous exporting experience were more likely to be exporting. The use of statistical techniques, such as the Chi-square test, to explore the extent to which exporting behaviour is associated with certain firm-specific characteristics confirmed the importance of size in exporting behaviour of firms. Comparing this behaviour with technological and innovative activities by firms, we find little evidence of any association with the exception of activities related to the transfer of skills and technological knowledge. In addition to the Chi-square test, we estimate a probit model to determine the relationship between the probability that the export-orientation of FDI firms is affected by a set of firm-specific factors. The probit estimates confirm the importance of previous exporting behaviour of firms (experience) and firm size as well as firm maturity (older firms) in explaining the likelihood of FDI firms exporting. Thus, both the Chi-square test and probit estimation results evidently point to the important influence of firm size, age and previous exporting experience in determining the export-orientation of FDI firms.

More generally, we observe that there are several approaches that can be used to investigate empirically the behaviour of firms (both domestic and foreign) with regard to their exporting activities. However, most empirical studies on FDI and export performance in host countries have attempted to explain the exporting behaviour of domestic firms in the presence of foreign firms. The results from these studies have generally been mixed; some studies find a positive impact of FDI on domestic firms whilst others find none. Our emphasis in this chapter has been to investigate the export-orientation of FDI firms, and not their impact on domestic firms. Despite our emphasis on the exporting behaviour of FDI firms, we find that as in other studies on the export-orientation of manufacturing firms in general, firm size and experience in exporting are very important factors that affect the ability of firms to export. Nonetheless, it is worth emphasising that this ability is also influenced by several other factors, such as industry-specific conditions, state legislation, the level of economic development, the nature of export markets, etc. that could not be explored in this study. This therefore points to the need for further research into understanding how the exporting behaviour of FDI and domestic firms are influenced by these other factors.

On the broader issue of FDI policy, the major preoccupation of policy makers has been, and still is, geared toward attracting more FDI. However, our findings point to the need to deploy a wide range of policy instruments and interventions to leverage the export benefits of FDI to the wider domestic manufacturing sector; the ability of domestic firms to export as a result of FDI – export spillovers – is one of the benefits to be derived by host countries. Thus, if a significant proportion of FDI firms are export-oriented, as evidenced from our research, then the potential export spillovers to other domestic firms must be harnessed as a means to improving the productivity and competitiveness of the Ghanaian manufacturing sector. This expectation – that exporting can improve the productivity and competitiveness of domestic firms – is predicated on findings from the literature (though not an entirely settled debate), which suggest that exporting firms are generally more productive and competitive than non-exporting firms. Although we acknowledge the possibility of reverse causality between export-orientation and productivity, the presence of a strong association between them (exporting and productivity) suggests that by learning from FDI firms, domestic firms might become productive, begin to export and eventually be competitive in international markets.

Chapter 8

Conclusions: The Future of Ghana's Policies towards FDI

8.0 Introduction

The purpose of this chapter is to use the findings of this study, from the literature and from our research, to develop and elaborate a policy framework towards FDI in Ghana. We have observed earlier that FDI policy has evolved over the years with varying effects in terms of FDI inflows. The policy framework developed here thus represents an opportunity to improve on the current policy framework, with the expectation that the potential benefits of FDI can be harnessed effectively by Ghana, and hopefully other SSA countries.

The main objective in this research has been to explore the extent to which the activities of FDI firms are associated with the transfer of technology within the Ghanaian manufacturing sector.[61] This study has been motivated in part by the emphasis in the literature that FDI serves as a channel for the international transfer of technology from industrialised to developing countries. There are also several benefits that host developing countries are expected to reap once FDI is located in their countries. With regard to FDI and the transfer of technology to developing countries, empirical research is very limited in the context of SSA, and the few studies on Ghana (Waldkirch and Ofosu 2010; Görg and Strobl 2005) yield very contrasting results. This therefore begs the question; to what extent does FDI result in technology transfer? Thus, by choosing an exploratory approach, this study aims to fill a void in the current literature on FDI and technology transfer in the SSA context.

[61] It is important to note that our emphasis was on international transfer of technology which, therefore, excluded any consideration of inter-firm transfers of technology.

The motivation for this study is also in part informed by the important role played by the manufacturing sector and the industrial sector in general, in the transition of developing countries from predominantly agrarian economies to emerging industrial countries. In the context of future government policy on economic development, this brings to the fore the need to incorporate FDI policy into any future industrial policy (narrowly defined to mean the state's support and intervention in industry) bearing in mind the potential for FDI to act as a stimuli for the rapid modernisation of the manufacturing sector.[62]

In the next section we present a summary of the main findings of the study with a brief discussion of the key issues arising. This provides the basis for a discussion on the important policy implications that emerge from the findings and the proposals for an FDI policy for Ghana that can be anchored in an industrial policy in section 8.2. In section 8.3 we highlight the gaps in this study and indicate areas for future research.

8.1 Summary of Main Findings

This study is a country case study on Ghana with the primary focus of exploring the extent to which FDI in the manufacturing sector is associated with the transfer of technology. A secondary objective was to explore the extent to which foreign direct investment is associated with exporting by FDI firms, and whether FDI firms were more likely to export compared with domestic firms. To put this summary in context we restate the specific research questions in Box 8.0 and the two research hypotheses in Box 8.1. The rest of the summary is presented in a tabular form and anchored on a discussion of the key issues arising from the literature and the findings of the research.

[62] We defer to the vast literature on industrial policy any discussion of the question of the appropriate definition of industrial policy.

Box 8.0: Specific Research Questions

- What are the main channels of technology transfer via FDI identified in theoretical and empirical research?
- How has government policy on FDI in Ghana evolved since independence, and what has been its impact on aggregate FDI inflows?
- What are the aggregate and sectoral patterns of FDI flows in Ghana?
- What are the main characteristics of FDI firms in the Ghanaian manufacturing sector?
- To what extent does FDI activity involve the transfer of technology to Ghana?
- What are the main channels for technology transfer by FDI firms in the manufacturing sector?
- What is the exporting behaviour of FDI firms?
- Are there differences between FDI and domestic firms in terms of technological activities and exporting behaviour?

Box 8.1: Research Hypotheses

Hypothesis 1: There is no difference between FDI firms and domestic firms in respect of technological activities.

Hypothesis 2: There is no difference between FDI firms and domestic firms in respect of exporting behaviour.

Table 8.1: Summary of Main Findings and Discussions Arising from Research

Key Issue	Results from Literature	Results from Research	Comments
Channels of Technology Transfer and Spillover	**Labour Training and Mobility:** The emphasis is on labour training first as a channel of technology transfer, and subsequently through labour mobility to other (domestic) firms as a channel for the spillover of modern technology and skills.	In this research the extent of formal training provided to workers by FDI firms was investigated. Whilst no direct hypothesis was tested in respect of training provided to workers, the provision of training provided by firms in general was used to derive a composite measure for the transfer of skills and technological knowledge. Although most FDI firms were found, individually, to provide various forms of formal training to different categories of workers, the composite measure for the transfer of skills and technological knowledge reveals that 35 percent of FDI firms undertook such activity. This suggests that the transfer of skills by FDI firms, such as marketing expertise, production management and other forms of tacit knowledge was not widespread.	There are obvious difficulties with this measure. First, it is difficult to observe actual training that occurs in firms to gauge the extent to which such training involves the transfer of technology. Nonetheless, because it is expected that training will be provided anyway (especially in the case of new firms), it suggests that a *special kind of technical training* must necessarily take place for it to be described as technology transfer. With regard to labour mobility as a means for the spillover of technology to other domestic firms, there is no guarantee that the *labour* moving out of a foreign firm is adequately imbibed with modern skills and technological knowledge. It is also feasible that the *labour* with previous working experience in a foreign firm is that which was less productive and that was subsequently sacked by the foreign firm. This type of *labour* will therefore have very little skills and technological knowledge to spill over.
	Forward and Backward Linkages: The emphasis is largely on spillover effects rather than technology transfer. Here the production relationship between	In the research we did not examine issues of the linkages between FDI firms and domestic firms. The data limitations meant we restricted our research to international transfer of technology by	Whilst the literature generally regards forward and backward linkages between foreign firms and domestic firms as a means by which technology might spill over, it is also possible that the nature of the arrangement

	MNEs and domestic firms is what gives rise to the possibility of backward/forward spillovers.	FDI firms.	between a foreign firm and a domestic firm can create conditions where the deliberate transfer of technology can occur. In other words if the nature of the relationship between the MNE and the domestic firm(s) requires that specific technologies be transferred before the domestic firm(s) is able to satisfy the required product specification, we might find a situation where inter-firm technology transfer and international technology transfer (where foreign firms are located outside the country) become possible outcomes from such linkages between MNEs and domestic firms.
	Demonstration Effects (Horizontal Spillovers): This arises when the presence of foreign firms generates learning and other productivity-enhancing spillovers to other firms in the industry or in other industries in the economy.	This type of technological knowledge spillover was not investigated in the research. Data limitations meant it was impossible to examine the impact of the presence of FDI firms in particular industries or determine the extent to which domestic firms were engaged in any form of *learning from watching* in a particular industry.	Although the presence of foreign firms can generate learning and other productivity-enhancing spillovers, this is only possible where the economic activity arising from a foreign investment is not of an enclave type. Besides, the ability of other firms to learn is dependent on their investments in innovative activities as well as their skill and knowledge base. In other words, the other firms' absorptive capacity is important in determining the extent to which *learning from watching* can result in horizontal spillovers.
	Mode of Entry of FDI: The means by which a foreign investment enters a country, either directly (greenfield investment) or through	The absence of any prior information on the characteristics of FDI firms meant no a priori hypothesis could be made in respect of joint venture firms	The mode of entry of a foreign firm largely influences how technology transfer might take place. International transfer of technology might occur as result of greenfield

	a joint venture or brownfield investment serves as the channel for the transfer of technology, either international cross-border transfers or inter-firm transfers.	for example. Consequently, the technological activities of joint venture firms were not investigated directly.	investment, joint ventures and brownfield investment. However, intra-firm transfers, such as those between a parent and a subsidiary can also take place; this might occur after a subsidiary has already been established. Further, in the case of joint ventures we might also expect that the level of absorptive capacity in the domestic partner would influence how much transfer of technology takes place in the early years of the joint venture arrangement. Nonetheless, we can expect that over the course of time the domestic firm's absorptive capacity will improve as a result of the joint venture arrangement such that there is an increased transfer of modern technology.
	Licensing and Technological Gap: The acquisition of product and technology licences represents one channel by which technology can be transferred from one country to another, although this can also be a channel for inter-firm transfers of technology. The main thrust behind the technological gap argument is that the quality of technology transferred between two countries is likely to be higher the narrower	The use of licences by FDI firms as a channel for the transfer of technology was not investigated. However, in examining the differences between FDI and domestic firms in terms of technological activities, the use of licences by domestic firms was used to capture the extent to which domestic firms were involved in technological activities. Evidence from WBES and RPED and GMES indicate that only a small proportion of domestic firms were involved in technological activities. In general, we found that foreign firms were	Given the threat that product and technology licences might be illegally acquired by competitors, the extent to which licences can be used is influenced by the intellectual property regime present in the recipient country, the enforceability of legal contracts, and the commitment of recipient firms to abide by contracts signed. It is also unclear why the use of licences by domestic firms is very low. These may be due to the absence of a market for such licences locally, the lack of knowledge in respect of how to successfully obtain these licences, the relatively weak legal system, or a relatively

	the gap between them.	more likely to undertake technological activities than domestic firms.	weak intellectual property regime. Whilst the technological gap between developed and developing countries is apparent, the absence of reliable data on innovative activities by developing countries limits the extent to which the technological gap between developed and developing countries can be used in empirical studies.
	Imports of Capital Goods: The central argument here is that capital equipment and other intermediate inputs produced in technologically-advanced countries are embedded with new and modern technologies and thus firms in developing countries can acquire advanced technology through imports of these equipment and inputs (although firms in other developed countries can also acquire modern technology via this channel).	The transfer of technology via the acquisition of capital equipment and other inputs produced in advanced countries by FDI firms was not investigated. However, in examining the differences between FDI and domestic firms in terms of technological activities, the acquisition of capital equipment by domestic firms was used to capture the extent to which domestic firms were involved in technological activities. Evidence from RPED and GMES indicate that foreign firms were more engaged in technological activities compared with domestic firms.	Whilst capital and other intermediate inputs produced in technologically-advanced countries may be embedded with relatively advanced technology, this may not always be the case. It is possible that the knowledge embedded in equipment obtained overseas may not be embedded with what might be considered relatively advanced technology after all, because the equipment or inputs may be for the replacement of depreciated equipment or inputs that are constantly used in production. Besides, whilst there is no obvious way to assess the level of technology embodied in capital equipment, it is also the case that the successful transfer of technology via capital equipment, assuming technology is embedded, requires the presence of local absorptive capacity in the recipient firm. This raises the prospect that imports of capital goods may not always be the best means to ensure a successful transfer of technology, especially one between two countries, unless

			this is accompanied by relevant technical expertise from the exporting country and the presence of local expertise (even if not of the same level as the foreign counterpart).
Has Government Policy over the years Influenced Inflows of FDI?	**Impact of Government Policies:** The main argument from the literature is that policies that stifle investment activity in general within countries are likely to discourage inflows of FDI; FDI flows are likely to respond favourably to liberal, market-friendly policies that encourage FDI. Whilst no specific hypothesis is set out for verification, the objective here was to assess the extent to which the pattern of FDI inflows has been influenced by government policies.	The findings from the research reveal that from 1960 to 1995 inflows were generally low, averaging less than $20 million per annum. We cannot provide a precise estimate of how policies may have contributed to this; however we find evidence to indicate that where policies have been openly anti-foreign capital there had been capital flight. In essence, where there is an apparent conflict or tension between government policies and rhetoric, it does not provide for coherence in policy towards FDI. The period after 1995, which coincided with the post-reform era, has witnessed a steady increase in FDI inflows exceeding $100 million per annum. In recent years, there have been outflows of FDI by Ghanaian firms, mainly from gold mining.	Whilst the importance of policy in influencing the pattern of FDI flows to and from Ghana cannot be overemphasised, it is also worthy to point out that these trends (observed pre-1995 and post-1995) also mirrored the nature of the world economic environment in those periods. From the early 1950s up to the latter 1980s many developing countries were generally hostile to foreign capital. Moreover, among some academics and policy researchers the view was that foreign investments would be detrimental to the development objectives of newly emerging independent countries and this gave some support to countries that pursued largely unfriendly policies towards FDI. In addition, the growth and importance of multinational enterprises was relatively less important in world trade compared to the present. Since the mid-1990s the dominance of MNEs in global trade has become evident, whilst at the same time the increased integration of world economies and the dominance of the Washington Consensus views have resulted in increased MNE and FDI

			activity globally. Consequently, it is impossible to disentangle effectively the influences of government policies on FDI from the external economic environment, all of which have a bearing on FDI inflows.
The Transfer of Technology by FDI Firms	**FDI and Technology Transfer:** FDI is one of several channels for the transfer of technology between countries. However, for developing countries FDI represents one of the easiest means by which international technology transfer can occur.	The paucity of information on the activities of FDI firms in Ghana necessitated the need for a survey of FDI firms to explore the extent to which technology transfer can be associated with FDI activities in Ghana. With no prior benchmarks with which to assess technology transfer activities, the expectation from the research was to discover the extent to which FDI firms engaged in technology transfer. The findings from the research reveal several interesting outcomes. Whilst most firms were engaged in activities that in our definition constituted technology transfer, 54 percent engaged in R&D activities between 2008 and 2009. Based on two crude measures we found that 57 percent engaged in product and process technology transfer, whilst 35 percent engaged in the transfer of skills and technological knowledge.	Assessing the impact of FDI in any economy is challenging, especially where data are limited. In this particular instance there was no pre-existing database to draw on for the study. Nevertheless, what this suggests is the need to build the capacity necessary for obtaining the various activity data (especially on technological activities, employment, and trade) associated with foreign and domestic firms. In addition, it is important to develop appropriate measures in a developing country context to capture appropriately the activities of firms related to technology transfer, not just between countries but within firms and across firms. Evidently, in the absence of such standardised measures, studies such as this would be fraught with several challenges that might appear to indicate that the findings are *weak*.

Differences Between FDI and Domestic Firms In Respect of Technological Activities and Export-Orientation	**Technological Activities:** The relationship between FDI and technological activity is strongly highlighted in the literature. This stems from the fact that MNEs engage in a significant proportion of global R&D activities. Thus the close association between FDI and MNE activity suggests that FDI firms are more likely to engage in technological activities than domestic firms.	The hypothesis arising from the literature is that FDI firms are expected to engage in more technological activities than domestic firms. However, the empirical measure of technology transfer is fraught with difficulties that stem largely from the fact that technology consists of elements that are tacit in nature, thus rendering its direct observation and measurement difficult. In spite of this challenge and the difficulty to compare directly the technological activities between domestic and FDI firms, we found that the proportion of FDI (and foreign firms) firms engaged in technological activities were more than those of domestic firms.[63]	The technological activities of both FDI and domestic firms are not observed directly.[64] However, based on several indirect measures we were able to gauge the extent to which both types of firms engage in technological activities; these findings are only indicative of the extent of technology-related activities by firms. Nevertheless, the evidence from the RPED/GMES and WBES indicate that most domestic firms, unlike FDI firms, do not engage in technological activities. Why this is so is unclear and will require further research to unravel. However, there appears to be evidence suggesting a relatively low degree of absorptive capacity (using information on the proportion of highly educated workers in the workforce and activities relating to training and innovation) within firms. Given the close association between firms' investment in technological activities and improvements in absorptive capacity, this reinforces the need for a better understanding of the reasons why the technological activities by domestic firms are generally low.

[63] FDI firms refer to firms from our survey and foreign firms refer to those identified from other surveys with at least 10 percent foreign ownership.

[64] In the RPED/GMEs and WBES we relied on the following as measures of technology transfer: use of foreign licences, imports of new equipment, and the provision of formal training to workers. As noted several times in this research these measures are only indicative because of the absence of appropriate measures for technological activities undertaken by domestic (and foreign) firms.

	Export-Orientation: Similar to the arguments above, the expectation is that FDI firms because of their superior marketing techniques and knowledge of overseas markets are more likely to export-oriented than domestic firms.	The hypothesis arising with respect to export-orientation is similar to that of technological activities. But it is worth noting that our research did not seek to determine empirically the impact of FDI on exports. Rather it sought to examine whether FDI firms were more likely to export compared with domestic firms. Again, despite our inability to compare directly the export-orientation of FDI and domestic firms (because both types of firms were not surveyed at the same time), we found that FDI firms are more export-oriented than domestic firms based on a quasi-comparison of FDI firms from our survey and domestic firms from the WBES.	Although the proportion of FDI firms that export was greater than that for domestic firms, we found that only 45 percent of FDI firms exported on a consistent basis between 2005 and 2008. Though significant the percentage of FDI firms that export is not very high. The study however falls short of investigating whether FDI is a determinant of export performance. The important implication in respect of this finding is the extent to which FDI can promote the development and growth of manufactured exports, especially considering the dynamic impacts on the rest of the economy. The importance of a growing and dynamic manufacturing sector is very important in the economic transformation of developing countries, and the role of FDI in promoting this change cannot therefore be overemphasised. What is unclear from this research is why relatively few manufacturing firms (foreign or domestic) engage in exports? There is thus the need for further research to understand the constraints facing manufacturing firms in their ability to enter export markets. Further, research on how the firm-specific assets of FDI firms with a strong export-orientation can be harnessed to develop domestic manufacturing capacity is needed.

8.1.1 A Summary of the Important Implications Arising

Judging by the evidence from the research, not all FDI generates the necessary technological benefits predicted by the firm-specific advantages espoused from the theory on FDI activity. Indeed, approximately 57 percent of FDI firms can be described as engaging in activities that relate to the transfer of technology. In respect of export-orientation, we also found that on a consistent basis only 45 percent of FDI firms were actively engaged in exporting. These are by no mean insignificant because there are obviously some tangible benefits to the Ghanaian economy regarding FDI activity. But what do these findings imply in terms of FDI policy? Should policy be skewed in favour of firms that are guaranteed to transfer technology or be targeting sectors and industries to which technology transfer occurs? Should the blanket policy of encouraging FDI (through fiscal and other incentives), whatever the expected benefits, be pursued even if it only results in the achievement of partial success for the relevant targets? Clearly whilst the evidence might not provide a concrete basis for recommending which policies might be appropriate, it provides a basis to explore which selective policies can be pursued to harness the benefits of FDI, such as the transfer of technology, up-scaling manufacturing activity and promoting exporting capacity, employment generation and sustained incomes for workers, improved tax revenues, and increased industrial competitiveness.

Another important issue that needs attention is the development of domestic absorptive capacity (whether at the national, institutional/public, private/corporate, and firm level). Whilst the need for absorptive capacity is clearly important in terms of the ability of domestic firms to up-skill and maximise the potential benefits of technological spillovers, it is also important for domestic firms in respect of their ability to effectively partake in joint-venture enterprises with foreign partners. Absorptive capacity is obviously closely related with technological activities, such as investments in innovation and R&D. But the development of domestic absorptive capacity, especially in a developing country context, depends greatly on the involvement of the state. Investments in R&D and other innovative activities can best be coordinated, financed and supervised by or under the auspices of the state. This clearly places the issue of absorptive capacity within the ambit of industrial policy, particularly so when the issue at stake relates to FDI and technology transfer. In the next section we put forward proposals for future policies towards FDI with these issues in mind.

8.2 A Proposal for Ghana's Future Policies towards FDI

The outcome of this study raises several policy implications for Ghana, which might also relate to other SSA countries. However, it is not possible to argue definitively on the future direction of FDI policy in Ghana. Nonetheless, the findings from this research are important in providing a basis for putting forward proposals for Ghana's future policies towards FDI. The need for technological upgrading of the manufacturing sector (and industrial sector in general) as well as the need for sectoral diversification of the economy away from a dependence on agriculture and extractive minerals suggest that more is needed by way of changes in the overall economic framework to achieve these goals. Moreover, domestic manufacturing firms are frequently small in size and lack the managerial and entrepreneurial skills to establish themselves as potential competitors on a global scale. Against this background, there clearly is the need for new thinking on how to improve the competitiveness of domestic manufacturing as well as its relative importance in the economy. Although several policies will have bearing on the industrial sector of the economy, in this section we elaborate only on policy actions that relate to FDI and aspects that form part of an overall industrial policy framework.

8.2.1 Good Policies and Actions Matter

Our analyses of government policies on FDI revealed a tendency for policies to be changed whenever governments changed. Indeed, between 1957 and 1985 there were seven different governments/administrations with varying lengths of period in office; the shortest period in government was 27 months, whilst the longest was nearly 11 years. During this 29 year period, legislation on FDI was changed six times, reflecting not just the changing political landscape but also reflecting the tensions inherent in political and economic strategies of the various political regimes and administrations. What was apparent was the uncertainty and lack of a clear policy direction with regard to foreign (and in some situations private domestic) capital, especially in the 1960s and 1970s when suspicion towards private capital, both domestic and foreign was evident.

However, by 1994 the circumstances had changed significantly; government actions and policies towards private capital appeared to be well synchronised.[65] The government was actively encouraging foreign investors, whilst at the same time putting in place other policies that were friendly towards private investment and pursing economic policies aimed at creating an enabling environment for business in general. It was also evident that lessons had been learnt, hence at the same time government was mindful of how its actions could so easily create suspicion in the minds of investors. Thus, although some of the policies on FDI appeared favourable on paper, the government was determined to create a posture that was encouraging of private business entrepreneurship and thus pursed actions that were intended both to remove doubts among private investors and to reassure the business community at large.

Although the main point being emphasised here is that *good* policies and an assured posture towards private capital by governments are important, further direct action will be needed not just to increase inflows but increase the importance of FDI in the economy especially with regard to promoting industrial development. In this regard direct action will be necessary to improve commercial and physical infrastructure and other logistics relating to business development and growth, develop an effective supply network of inputs produced by domestic firms, incorporate business leaders in decision-making processes that affect the industrial sector, address aggressively the problems that hinder trade facilitation (especially at sea ports and on the roads), and encourage the development of viable local markets with the ultimate goal of integrating these markets with those in the sub-region.

8.2.2 How to Maximise Technology Transfer through FDI and Other Ways?

It is apparent from our findings that FDI in Ghana's manufacturing sector is associated with the transfer of technology. This is obvious in respect of product and process technology, but less obvious in respect of skills and knowledge transfer by means of formal training. What is however unknown is how much technology transfer is taking place and what types of technology and other forms of knowledge are being

[65] By 1994 Ghana had been pursing IMF and World Bank supported economic reforms for nearly 11 years. Average FDI inflows between 1985 and 1994 had risen from nearly US$18 per annum for the previous two decades to approximately US$45 million per annum. Annual inflows of FDI began to rise significantly after 1994.

transferred. In the absence of this information, we are unable to assess the extent of spillovers occurring in the wider manufacturing sector as a result of the presence of foreign direct investment.

Looking ahead however, it is important to emphasise that future FDI policy must be more targeted towards ensuring an increase not only in foreign capital but foreign technology and skills that facilitate the transformation of productive capacity, scale of operations and improves the competitive edge (competitiveness) of Ghanaian manufacturing. In this regard, the important policy issue here is to integrate FDI policy into an overall framework of industrial policy. However with regard to maximising the transfer of technology to Ghana, and especially with respect to FDI, it is important to stress that there are several other channels for the transfer of technology.

In respect of international transfer of technology, FDI is only one option. Other channels, such as joint ventures, licensing agreements, management contracts, turnkey projects, the market for patents and trademarks and international trade are also important avenues by which technology transfer can be achieved. Thus, it is obvious that FDI may not be appropriate in all cases with regard to the objective of encouraging technology transfer to Ghana. Moreover, it is important to note that because technology transfer can consist of several types – international transfers, inter-firm transfers and intra-firm transfers – no one policy instrument will adequately address the objective of maximising the transfer of technology to Ghana. Further, not all options may be readily available thus requiring a greater degree of flexibility not just in policy but in the various approaches that may be utilised in harnessing the most appropriate technology from other countries and multinational firms.

The preceding discussion clearly points to the need for an array of policies to maximise the transfer of technology to Ghana; policies not just for FDI but on trade and technology development as well as developing the necessary absorptive capacity in the economy. With regard to FDI policy, it is important to strive at attracting the *right type* of FDI. By the *right type* we mean FDI that is associated with the transfer of appropriate, more modern, and advanced technologies. Clearly the challenge here lies in identifying what appropriate technologies are needed and how best to acquire them. To begin we propose that in the case of established industries, such food and beverages, and plastics and chemicals that are currently operating at a significantly higher scale, efforts should be targeted at securing management contracts with specific objectives set

under these arrangements. These objectives must include, the development of local managerial and organisational capacity, training of local workers aimed at providing appropriate skills, development of overseas marketing relations, and increased integration in world trade via production and supply chains. In this instance, encouraging FDI into these industries may not be the most appropriate option to pursue. Although it may be argued that encouraging FDI into these industries can foster competition and possibly generate spillovers to the domestic firms, we believe that there is the possibility that such competition might result in the demise of local manufacturing capacity and the consequent loss in the ability to achieve a successful transformation of the economy. Hence the need for options such as management contracts, which hold the possibility of achieving increased capacity, improved productivity and greater international competitiveness in these industries.

In other industries that hold greater promise of expansion and development, such as petroleum, textiles, and wood and furniture, encouraging more joint ventures between local and established foreign firms might be the best way to achieve increased production and export development rather than greenfield FDI. A joint venture can be an attractive entry option for a foreign partner because it might involve a small capital investment whilst also providing the foreign firm access to an established domestic market base. Further, to ensure the success of these arrangements, it is important for the state to provide all necessary resources whilst at the same time securing the unfaltering and purposeful participation by the foreign partners. Similar to the case of management contracts cited earlier, specific targets, such as those already mentioned should be set to assess the effectiveness of these arrangements and thus be able to measure the success or otherwise of particular joint venture agreements. Despite the initial cost implications on the side of domestic firms and the state, the long-term potential benefits must be weighed up clearly so that these joint ventures do not turn out to be financial burdens on the state and domestic partners.

Given that the existing FDI policy has evidently reaped some benefits, it is important to stress that we will not advocate a discontinuation of existing policies (which seems focused on just increasing the number of FDI projects) but an improvement in policy goals and instruments. Thus, with regard to the objective of ensuring increased transfers of technology, there is the need to attract investment projects that result in greater linkages – forward and backward linkages – with the rest of the economy if the structural and dynamic changes in the economy that are required

to provide accelerated growth are to be achieved. Foreign investments that create enclave-like conditions are unlikely to result in any linkages between foreign and domestic firms, with the certain eventuality that no transfers of technology will occur. To avoid this undesirable outcome, FDI policy must include instruments and incentives that encourage foreign investments that forge close links with domestic suppliers of inputs with the objective of not only expanding the market for domestic suppliers but through such relationships promote inter-firm transfers of technology, such as the impartation of necessary technological know-how, and management and organisational practices. Indeed it will be expected that where FDI projects serve to expand the market for domestic suppliers of inputs, imports of inputs by foreign firms will decline with the result that domestic suppliers gradually expand production, eventually resulting in the production of more complex inputs not just for the domestic market but also for exports. It also possible to expect that through such export relations with overseas producers, domestic firms will acquire better technology through training visits to overseas producers and eventually begin to develop and export products (instead of inputs) to be marketed in foreign markets under the previous arrangements with these overseas producers.

With regard to the promotion of and growth in manufactured exports, which must be one of several objectives of industrial policy in Ghana, it is important to indicate how FDI might be important in achieving this objective. It is evident that domestic firms and multinationals are usually separated not just by technology but access to export markets. The success of firms in terms of higher productivity and increased scale of operations is strongly associated with participation in export markets. Hence, multinationals by virtue of the scale of their global operations can play an important part in the development of domestic manufacturing export capacity. Consequently, future FDI policy must strive to encourage foreign investments that facilitate the integration of domestic firms into global supply chains.[66] Whilst joint ventures are one such means to achieving greater integration into global supply chains, government can assist domestic firms to acquire licences for production technology and product design with the objective of ensuring the manufacture of products of international standards that can easily compete on international markets. In this regard

[66] Whilst it is obviously the case that such foreign investments must have a global reach or at least a significant presence in the world, clear targets must be set under these arrangements. These can include the need to incorporate domestic manufacturing firms into their operations, the transfer of productivity-enhancing technology as well as other technical know-how that will facilitate the technological upgrading of domestic manufacturing activities.

the development of an effective and efficient intellectual property regime to assure not just foreign investors but also other multinational firms not operating in Ghana is imperative. In the absence of a strong intellectual property regime, it is difficult to foresee how the acquisition of high-technology licences by the government and/or domestic enterprises can be achieved. What is apparent is the important role of the state in facilitating these important changes, not only in policy but in assisting domestic firms to build-up domestic industrial capabilities and capacities to engage actively in international export markets and global supply chains. It is this role that the state must play in propping up domestic industries that makes it imperative to integrate FDI policy into broader development strategies.

8.2.3 The Importance of Investments in Local Absorptive Capacity

The need to integrate FDI policy into a broader development strategy, such as an industrial policy is most vivid once we consider the importance of local absorptive capacity. It is without doubt that FDI can make the best contribution to the development objectives of a country if domestic capabilities are well-developed and competitive. In this research, we found evidence that the provision of formal training by FDI firms to their top level managers was limited to specific areas and not extensive. Moreover, training within domestic firms was inadequate. The provision of formal training to workers is only one of the important ingredients in the development of domestic absorptive capacity. Investments in R&D (in-house within firms and in the overall economy), investments in higher education to ensure an adequate supply of skilled manpower, the establishment of appropriate government and quasi-government institutions, and the promotion of production relations between MNEs and domestic firms are other means by which domestic absorptive capacity can be developed.

The importance of well-developed domestic capabilities and capacities in the processes involved in transfer, diffusion and spillover of technology has been already noted. It is clear that the technological benefits of FDI and its impact on economic growth, particularly industrial growth, cannot be realised if local capabilities are lacking or insufficient. But in respect of developing local absorptive capacity, it is apparent that FDI alone cannot achieve this. Indeed, investments in improving local absorptive capacity cannot be the sole function of foreign firms. In developing countries with limited private sector capabilities this function falls largely on the state,

and this can be achieved within an industrial policy framework. But despite the current economic policy regime deeply founded on neoliberal economic thinking and thus relying extensively on the notion of free markets, there is a strong role for the state in relation to expanding local absorptive capacity, not just in the industrial or manufacturing sector but the rest of the economy. Thus, in addition to FDI policy, specific policies on education and technology are important in realising the objective of improving domestic absorptive capacity.

In order to achieve the objective of improving the absorptive capacity of domestic manufacturing, the state must actively work with firms and other organisations and associations in the industrial sector to upgrade firm-level skill and technical training capacity whilst also engaging with educational institutions to ensure that the quality of graduates coming out of secondary and post-secondary institutions are of a high quality to enable them work effectively as well as learn and adapt to new and changing technologies. Of particular importance is the need not just to invest in the literacy and mathematical skills of pre-secondary students, but in formal higher and graduate level training in science, engineering and firm-level technical and managerial training. These investments are especially important because technological progress is now proceeding at a very fast pace. Other actions that the state can undertake to improve local capabilities may consist of several of the following: providing technology infrastructure, subsidies and financial support to both state and non-state development and research institutions, improve the relationship between universities and domestic firms, and commitments to invest at least a specified proportion of national income on research and development activities. Further, the state should actively be engaged in the development of the manufacturing sector by encouraging and supporting firms to re-tool and acquire more modern equipment. These could be achieved through tax incentives and technical cooperation agreements that place emphasis on providing domestic firms information and support to link up with foreign manufacturers of equipment. To minimise any rent-seeking behaviour by domestic firms specific targets (such as those related to the need to improve productivity) must be set in these state-sponsored support mechanism.

Several points have been raised in the preceding paragraphs that relate to education and technology policy. Thus, in addition to ensuring an effective intellectual property regime and dedicated investments toward research and development activities, tax incentives to promote private sector investments in innovation and other research

and development activities and technology acquisition via licensing must be pursued. Further to this point, a national technology fair, where FDI firms are encouraged to interact with domestic firms and other organisations engaged in R&D and other technology-related activities should be held annually. This forum can serve as a substitute for a technology market, which is non-existent in many developing countries. It is our expectation that this level of interaction can result not only in building up domestic firms' capabilities, but also enhance their capacity to capture effectively the potential benefits associated with FDI activity in a host developing country.

8.3 Prospects for Future Research

This study has explored technology transfer activities of FDI firms in Ghana's manufacturing sector based on own survey conducted during fieldwork in Ghana. The contribution made by this research in respect of the empirical literature on the activities of FDI firms in SSA is to provide new insights to the technology transfer activities of FDI firms in host developing countries. Nevertheless, it is worth reflecting, albeit briefly, on the most important challenge associated with gauging the extent of technology transfer activities undertaken by firms. Whilst the theoretical and conceptual differences between technology transfer and spillover can be delineated in the literature, the empirical investigations can be daunting. This stems largely from the difficulty in directly observing and measuring activities that may be regarded as constituting either technology transfer or spillover. Besides, the different modes by which technology transfer can occur – international transfer, inter-firm transfer, and intra-firm – and the different channels by which transfers can take place, such as via FDI activity or joint ventures, as well as the potential externalities that, arise suggest that any analytical framework must set clear boundaries within which these separate but inter-related issues must be studied. As experienced in this research we only explored activities relating to international technology transfer by FDI firms, thus ignoring other aspects of technology transfer, such as inter-firm transfers between FDI firms and domestic firms as well as other channels, such as joint ventures and other linkages between domestic firms and MNEs located in or outside Ghana. Thus, in terms of future empirical research on international transfer of technology to developing countries, while data considerations are important it is also obvious that devising appropriate methods to observe directly and assess appropriately the various aspects of

technology transfer and the resulting spillover effects to the rest of the economy must be paramount.

Consequently, it is worth pointing out the gaps in this research that can serve as the basis for future research on this subject. Firstly, the choice of an exploratory approach to investigate the international transfer of technology by FDI firms to Ghana implies our inability to examine other aspects of FDI activities, not least the various possible channels by which technology transfer can take place, such as inter-firm transfers, intra-firm transfers and transfers via joint venture agreements as well as activities relating to employment creation, potential contributions to the national tax intake, and the motivations for investment decisions by foreign investors. Evidently, our research only represents a partial assessment of the technology transfer activities by FDI firms in the context of a developing country, and further detailed research is thus required not just in this area but on other channels of technology transfer. Additionally, there is a need to investigate the impact of the activities that FDI firms engage in not just in manufacturing but in other sectors, such as in services and mining. There is also the need for further research on what interventions and policies developing country governments can purse to harness effectively the benefits from FDI as well as the means by which FDI policy can be integrated effectively into their overall development policy framework.

Secondly, the development of appropriate measures for technological activities undertaken by firms (foreign and domestic) is important. Our study relied on several indirect measures that provided only a partial picture on technology transfer by FDI firms and the technological activities of domestic firms. Although the findings are revealing and yield some insights into technology transfer and other technological activities by firms, further work is required to improve the methodology used for innovative and impact studies in developing countries in order to assess appropriately and effectively the nature and impact of foreign activities.

Thirdly, data limitations also imply our inability to explore the dynamics involved in exporting behaviour by FDI firms in detail, especially the important factors that influence the export-orientation of FDI firms and the conditions under which firms expand into exporting activities. Moreover, the analysis of differences between the exporting behaviour of FDI firms and domestic firms need further investigation given the simplified approach used in this research. On a related matter, we were also unable

to investigate the impact of FDI firms on the export activities of domestic firms, an empirical issue that has received a lot of attention in the literature. Thus, detailed research on the factors that affect firms' export behaviour as well as the dynamics involved in exporting behaviour is warranted.

Looking ahead, it is obvious that for host developing countries to understand how the benefits of FDI can be maximised whilst the costs are minimised, the first area for action is the collection of quality data not just on employment, wages, output and exports, but also on the innovative activities by firms. There is no denying the importance of quality and reliable data on the activities of (FDI) firms in the formulation of appropriate policy actions, especially in relation to the promotion of FDI and assessing its impact on countries. This brings to the fore the need for countries to build the capacity to carry out regular surveys on both FDI and domestic firms, to collect data which can be analysed over a longer period of time. This is also imperative, especially in the case of FDI, in assessing the benefits and possible costs of FDI activities in host developing countries. Moreover, the availability of quality and reliable data also permits the conduct of high quality research, the results of which are important for future policy formulation.

References

Abor, Joshua, C. K. D. Adjasi and Mac-Clara Hayford (2008), "How Does Foreign Direct Investment Affect the Export Decisions of Firms in Ghana?" *African Development Review*, 20 (3): 446–465.

Abu-Lughod, Lila (1988), "Fieldwork of a Dutiful Daughter," In Soraya Altorki and Camillia Fawzi El-Solh (eds.), *Arab Women in the Field: Studying your own Society*, Syracuse, New York: Syracuse University Press, pp: 139-162.

Acemoglu, Daron (1997), "Training and Innovation in an Imperfect Labour Market," *The Review of Economic Studies*. 64 (3): 445-464.

Acharya, Ram C. And Wolfgang Keller (2007), "Technology Transfer through Imports," *NBER Working Paper*, No. 13086.

African Development Bank (2006), *Selected Statistics on African Countries, Volume 25*, Tunis: African Development Bank.

African Development Bank (2007), *Selected Statistics on African Countries, Volume 26*, Tunis: African Development Bank.

African Development Bank (2009), *African Statistical Yearbook 2009*, Tunis: African Development Bank.

Agbesinyale, Patrick (2003), "Ghana's Gold Rush and Regional Development: The Case of Wassa West District," *SPRING Research Series No. 44*, SPRING Centre, Faculty of Spatial Planning, University of Dortmund.

Agresti, Alan and Barbara Finlay (1999), *Statistical Methods for the Social Sciences*, 3rd Ed, Upper Saddle River, N.J.: Prentice Hall.

Ahiakpor, J. C. W. (1990), *Multinationals and Economic Development: An Integration of Competing Theories*, London and New York: Routledge.

Aitken, Brian J., Gordon H. Hanson and Ann E. Harrison (1994), "Spillovers, Foreign Investment, and Export Behaviour," *NBER Working Paper*, No. 4967.

Aitken, Brian J., Ann Harrison and Robert E. Lipsey (1996), "Wages and Foreign Ownership: A Comparative Study of Mexico, Venezuela, and the United States," *Journal of International Economics*, 40(3-4): 345-371.

Aitken, Brian J., Gordon H. Hanson and Ann E. Harrison (1997), "Spillovers, Foreign Investment, and Export Behaviour," *Journal of International Economics*, 43(1-2): 103-132.

Aitken, Brian J. and Ann Harrison (1999), "Do Domestic Firms Benefit from Direct Foreign Investment? Evidence from Venezuela," *The American Economic Review*, 89(3): 605-618.

Ajayi, Ibi S. (ed.) (2006), *Foreign Direct Investment in Sub-Saharan Africa: Origins, Targets, Impact and Potential*, Nairobi: African Economic Research Consortium.

Akurang-Parry, K. O. (2002), "Passionate Voices of Those Left behind: Conversations with Ghanaian Professionals on the Brain Drain and Its Net Gains," *African Issues*, 30(1): 57-61.

Alfaro, L., A. Chanda, S. Kalemli-Ozcan and S. Sayek (2004), "FDI and Economic Growth: the Role of Local Financial Markets," *Journal of International Economics*, 64(1): 89-112.

Alfaro, Laura, S. Kalemli-Ozcan and S. Sayek (2009), "Foreign Direct Investment, Productivity, and Financial Development," *The World Economy*, 32(1): 111-135.

Aliber, Robert Z. (1971), "International Banking: A Survey," *Journal of Money, Credit and Banking*, 16(4) Part 2: 661-676.

Alschuler, Lawrence R. (1988), *Multinationals and Maldevelopment: Alternative Development Strategies in Argentina, the Ivory Coast and Korea*, London: The Macmillan Press Ltd.

Alvarez, Roberto and Ricardo A. López (2008), "Is Exporting a Source of Productivity Spillovers?" *Review of World Economics*, 144(4): 723–749.

Anarfi, J. K. (1982), *International Labour Migration in West Africa: A Case Study of the Ghanaian Migrants in Lagos, Nigeria*, Accra: Regional Institute for Population Studies, University of Ghana.

Anarfi, J. K., K. Awusabo-Asare, et al. (2000), "Push and Pull Factors of International Migration. Country Report: Ghana," *Eurostat Working Papers* 2000/E(10).

AngloGold Ashanti (2005), *A History of the Ashanti Goldfields Company*, accessed on the web at (http://www.anglogold.co.za/NR/rdonlyres/BDB5B570-C236-4C5B-9F53-1B5ED83F7E0C/0/Ashanti_CompanyHistory.pdf) on 10th May 2011.

Anwar, Sajid and Lan Phi Nguyen (2010), "Absorptive Capacity, Foreign Direct Investment-linked Spillovers and Economic Growth in Vietnam," *Asian Business and Management*, 9(4): 553–570.

Arrighi, Giovanni (2002), "The African Crisis: World Systemic and Regional Aspects," *New Left Review*, 15 (May-June): 5-36.

Arrow, Kenneth J. (1969), "Classificatory Notes on the Production and Transmission of Technological Knowledge," *The American Economic Review*, 59(2): 29-35.

Aryeetey, E., J. Harrigan and M. Nissanke (eds.) (2000), *Economic Reforms in Ghana: The Reality and the Mirage*, Accra, Ghana: Woeli Publishing Services.

Aryeetey, Ernest and Jane Harrigan (2000), "Macroeconomic and Sectoral Developments Since 1970," In E. Aryeetey, J. Harrigan and M. Nissanke (eds). *Economic Reforms in Ghana: The Miracle and the Mirage*, London: James Currey, pp: 5-31.

Aryeetey, Ernest, Augustin Fosu and Mahamudu Bawumia (2001), *Explaining African Economic Growth Performance: The Case of Ghana*, Nairobi: African Economic Research Consortium.

Aryeetey, Ernest and Ravi Kanbur (eds.) (2008), *The Economy of Ghana: Analytical Perspectives on Stability, Growth and Poverty*, Oxford: James Currey; Accra, Ghana: Woeli Publishing Services.

Asiedu, Elizabeth (2002), "On the Determinants of Foreign Direct Investment to Developing Countries: Is Africa Different?" *World Development*, 30(1): 107-119.

Asiedu, Elizabeth (2004a) "Policy Reform and Foreign Direct Investment to Africa: Absolute Progress but Relative Decline," *Development Policy Review*, 22(1): 41-48.

Asiedu, Elizabeth (2004b), "The Determinants of Employment Affiliates of US Multinational Enterprises in Africa," *Development Policy Review*, 22(4): 371-379.

Asiedu, Elizabeth (2005), "Foreign Direct Investment in Africa: The Role of Natural Resources, Market Size, Government Policy, Institutions and Political Instability," *The World Economy*, 29(1): 63-77.

Athukorala, Prema-chandra (2007), *Multinational Enterprises in Asian Development*, Cheltenham, U.K.: Edward Elgar.

Aw, B. Y. and A. R. Hwang (1995), "Productivity and the Export Market: A Firm-Level Analysis," *Journal of Development Economics*, 47(2): 313-332.

Aw, B., S. Chung and M. J. Roberts (2000), "Productivity and Turnover in the Export Market: Micro-level Evidence from the Republic of Korea and Taiwan (China)," *World Bank Economic Review*, 14(1): 65-90.

Baah-Nuakoh, Amoah (1997), *Studies on the Ghanaian Economy: Volume 1, The Pre-'Revolutionary' Years, 1957-1981*. Accra: Ghana Universities Press.

Balasubramanyam, V., M. Salisu D. Sapsford (1996), "Foreign Direct Investment and Growth in EP and is Countries," *The Economic Journal*, 106(434): 92-105.

Bank of Ghana (2008), *Statistical Bulletin – February 2008*, Accra: Bank of Ghana.

Bank of Ghana (2009), *Statistical Bulletin – December 2008*, Accra: Bank of Ghana.

Barnett, Vic (1991), *Sample Survey: Principles and Methods*, London: Edward Arnold.

Barron, J. M., M. C. Berger and D. A. Black (1997), "How Well Do We Measure Training?" *Journal of Labour Economics*, 15(3): 507-528.

Barthel, Fabian, Matthias Busse and Robert Osei (2008), "The Characteristics and Determinants of FDI in Ghana" available at http://ssrn.com/abstract=1308197

Basu, Anupam and Krishna Srinivasan (2002), "Foreign Direct Investment in Africa-Some Case Studies," *IMF Working Paper*, No. 02/61.

Batra, R. N. and R. Ramachandran (1980), "Multinational Firms and the Theory of International Trade and Investment," *American Economic Review*, 70(3): 278-290.

Bayliss, Kate (2004), *Privatisation in Sub-Saharan Africa: The Implications for Development* (Unpublished PhD Thesis), School of Oriental and African Studies, University of London.

Beausang, Francesca (2003), *Third World Multinationals: Engine of Competitiveness or New Form of Dependency*, Houndsmills, Basingstoke: Palgrave Macmillan.

Behrman, Jack (1972a), "Industrial Integration and the Multinational Enterprise," *The ANNALS of the American Academy of Political and Social Science*, 403(1): 46-57.

Behrman, Jack (1972b), *The Role of International Companies in Latin America: Autos and Petrochemicals*, Lexington, MA: Lexington Books.

Bellak, Christian (1998), "The Measurement of Foreign Direct Investment: A Critical Review," *The International Trade Journal*, 12(2): 227-257.

Ben-Hamida, L. (2007), "Is There an Interaction between FDI Spillover Mechanisms and Domestic Absorptive Capacity: The Swiss Case," *Economic and Social Policy Institute, University of Fribourg Working Paper*.

Bennell, Paul (1990), "British Industrial Investment in Sub-Saharan Africa: Corporate Responses to Economic Crisis in the 1980s," *Development Policy Review*, 8(2): 155-177.

Bennell, Paul (1997), "Foreign Direct Investment In Africa: Rhetoric and Reality," *SAIS Review*, 17(2): 127-139.

Bernard, A. B., J. B. Jensen and R. Lawrence (1995), "Exporters, Jobs, and Wages in U.S. Manufacturing: 1976-1987," *Brookings Papers on Economic Activity, Microeconomics*, 1995: 67-119.

Bernard, A. B. and J. B. Jensen (1999a), "Exceptional Exporter Performance: Cause, Effect, or Both?" *Journal of International Economics*, 47(1): 1-25.

Bernard, A. B. and J. B. Jensen (1999b), "Exporting and Productivity," *NBER Working Papers* No. 7135.

Bernard, A. B. and J. B. Jensen (1999c), "Why Some Firms Export," *NBER Working Papers*, No. 8349.

Bernard, Andrew B. and J. Bradford Jensen (2001), "Why Some Firms Export?," *NBER Working Papers*, No. 8349.

Bhagwati, Jagdish (2007), "Why Multinationals Help Reduce Poverty," *The World Economy*, 30(2): 211-228.

Bhattacharya, A., P. Montiel and S. Sharma (1997), "How Can Sub-Saharan Africa Attract More Private Capital Inflows?" *Finance and Development*, 34(2): 3-6.

Biemer, P. P. And S. L. Christ (2008), "Weighting Survey Data," In J. Hox, E. de Leeuw, & D.A. Dillman (eds.), *The International Handbook of Survey Methodology*, New York: Lawrence Erlbaum Associates.

Biggs, T., M. Shah, and P. Srivastava (1995), "Technological Capabilities and Learning in African Enterprises," *World Bank Technical Paper,* No. 288, Africa Technical Department Series.

Bigsten, Arne (1998), "Can Aid Generate Growth in Africa?," *Working Papers in Economics,* Göteborg University, Department of Economics.

Bigsten, Arne, P. Collier, S. Dercon, M. Fafchamps, B. Gauthier, J. W. Gunning, A. Isaksson, A. Oduro, R. Oostendorp, C. Pattillo, M. Söderbom, and F. Teal (1998), "Rates of Return on Physical and Human Capital in Africa's Manufacturing Sector," *Centre for the Study of African Economies Working Paper Series* No, WPS/1998/12.

Bigsten, Arne, P. Collier, S. Dercon, B. Gauthier, J. Gunning, A. Isaksson, A. Oduro, R. Oostendorp, C. Pattillo, M. Soderbom, M. Sylvain, F. Teal, and A. Zeufack (1999a), "Exports of African Manufactures: Macro Policy and Firm Behaviour," *Journal of International Trade and Economic Development*, 8(1): 53-71.

Bigsten, Arne, P. Collier, S. Dercon, B. Gauthier, J. W. Gunning, A. Isaksson, A. Oduro, R. Oostendorp, C. Pattillo, M. Söderbom, M. Sylvain, F. Teal, and A. Zeufack (1999b), "Investment in Africa's Manufacturing Sector: a Four Country Panel Data Analysis," *Oxford Bulletin of Economics and Statistics*, 61(4): 489–511.

Bigsten, Arne, P. Collier, S. Dercon, M. Fafchamps, B. Gauthier, J. W. Gunning, J. Habarurema, A. Oduro, R. Oostendorp, C. Pattillo, M. Söderbom, F. Teal, and A. Zeufack (2000), "Exports and Firm-Level Efficiency in African Manufacturing," *CSAE Working Paper,* No. WPS/2000-16.

Bigsten, Arne, P. Collier, S. Dercon, M. Fafchamps, B. Gauthier, J. W. Gunning, A. Isaksson, A. Oduro, R. Oostendorp, C. Pattillo, M. Söderbom, F. Teal, and A. Zeufack (2002), "Do African Manufacturing Firms Learn from Exporting?," *CSAE Working Paper,* No. WPS/2002-09.

Bigsten, Arne, P. Collier, S. Dercon, M. Fafchamps, B. Gauthier, J. W. Gunning, A. Oduro, R. Oostendorp, C. Pattillo, M. Söderbom, F. Teal, and A. Zeufack (2004), "Do African Manufacturing Firms Learn from Exporting?," *Journal of Development Studies*, 40(3): 115–141.

Bigsten, Arne and Måns Söderbom (2005), "What Have We Learnt from a Decade of Manufacturing Enterprise Surveys in Africa?," *World Bank Policy Research Working Paper Series* No. 3798.

Blalock, Garrick and Paul J. Gertler (2004), "Firm Capabilities and Technology Adoption: Evidence from Foreign Direct Investment in Indonesia," *Department of Applied Economics and Management Working Paper*, Cornell University.

Blomström, Magnus (1989), *Foreign Direct Investment and Spillover,* London and New York: Routledge.

Blomström, Magnus (1990), *Transnational Corporations and Manufacturing Exports from Developing Countries,* New York: United Nations Centre on Transnational Corporations.

Blomström, M., A. Kokko and M. Zejan (1994), "Host Country Competition and Technology Transfer by Multinationals," *Weltwirtschaftliches Archiv*, Band 130: 521-533.

Blomström, M., and E. Wolff (1989), *Multinational Corporations and Productivity Convergence in Mexico*, New York: C.V. Starr Centre for Applied Economics, New York University.

Blomström, Magnus and Ari Kokko (1995), "Multinational Corporations and Spillovers: A Review of the Evidence," *Stockholm School of Economics Working paper*.

Blomström, Magnus and Ari Kokko (1997), "How Foreign Investment affects Host Countries," *World Bank Policy Research Working Paper* No. 1745.

Blomström, Magnus and Ari Kokko (1998), "Multinational Corporations and Spillovers," *Journal of Economic Surveys*, 12(3): 247-277.

Blomström, Magnus and Ari Kokko and Mario Zejan (1994), "Host Country Competition, Labour Skills and Technology Transfer by Multinationals," *Review of World Economics*, 130(3): 521-533.

Bloom, Martin (1992), *Technological Change in the Korean Electronics Industry*, Paris: Development Centre of the Organisation for Economic Cooperation and Development.

Boeh-Ocansey, Osei (2008), "Private Sector Development in Ghana: The Challenges and the Lessons," Accra: Private Enterprise Foundation (Ghana).

Borensztein, E., De Gregorio, J., and Lee, J. W. (1998), "How does foreign direct investment affect economic growth?," *Journal of International Economics*, 45(1): 115–135.

Bos, H.C., M. Sanders and C. Secchi (1974), *Private Foreign Investment in Developing Countries: A Quantitative Study on the Evaluation of Its Macro-Economic Impact*, (International Studies in Economics and Econometrics Series, Vol. 7), Kluwer Academic Publishers.

Bosworth, B. P., S. M. Collins and C. M. Reinhart (1999), "Capital Flows to Developing Countries: Implications for Saving and Investment," *Brookings Papers on Economic Activity*, 9(1): 143-180.

Bowen, H. P, A. Hollander, and Jean-Marie Viaene (1998), *Applied International Trade Analysis*, Houndsmill, Basingstoke: Macmillan Press Ltd., pp. 7 – 8.

Brainard, Lael S. (1993), "A Simple Model of Multinational Corporations and Trade with a Trade-Off between Proximity and Concentration," *NBER Working Paper* No. 4269.

Brainard, Lael S. (1997). "An Empirical Assessment of the Proximity-Concentration Trade-off between Multinational Sales and Trade". *The American Economic Review*, 87(4): 520-544.

Broadman, Harry G. (2007), *Africa's Silk Road: China and India's New Economic Frontier*, Washington DC: The World Bank.

Brown , Merrit T. (1972), "Macroeconomic Data of Ghana (Part II)," *The Economic Bulletin of Ghana*, 2nd Series, 2(2): 61 - 79.

Brownbridge, M., A. F. Gockel and R. Harrington (2000), "Saving and Investment," In *Economic Reforms in Ghana: The Miracle and the Mirage*, Ernest Aryeetey, Jane Harrigan and Machiko Nissanke (eds.), London: James Currey, pp. 132-150.

Buckley, P. J. and M. C. Casson (1976), *The Future of the Multinational Enterprise*, London: Homes & Meier: London.

Buckley, P. J., J. Clegg and H. Tan (2006), "Knowledge Transfer to China: Policy Lessons from Foreign Affiliates," In Peter J. Buckley, *The Multinational Enterprise and the Globalisation of Knowledge*, New York: Palgrave Macmillan, pp: 153-183.

Cantwell, John A. (1989), *Technological Innovation and Multinational Corporations*, Oxford: Basil Blackwell.

Cantwell, John A. and C. Hodson (1991), "Global R&D and UK Competitiveness," In M. C. Casson (ed.), *Global Research Strategy and International Competitiveness*, Oxford: Basil Blackwell.

Carkovic, Maria and Ross Levine (2002), "Does Foreign Direct Investment Accelerate Economic Growth?," *mimeo*, University of Minnesota .

Casley, D. J. and D. A. Lury (1984), *Data Collection in Developing Countries*, New York: Oxford University Press.

Caves, Richard E. (1974), "Multinational Firms, Competition and Productivity in Host-Country Markets," *Economica*, 41(162): 176–93.

Caves, Richard E. (1996), *Multinational Enterprises and Economic Analysis*, 2nd ed., Cambridge, England: Cambridge University Press.

Chen, E. K. Y. (1996), "Transnational Corporations and Technology Transfer to Developing Countries," In *Transnational Corporations and World Development*, London: International Thompson Business Press (on behalf of UNCTAD Division on Transnational Corporations and Investment), pp: 181-214.

Choe, Jong I. (2003), "Do Foreign Direct Investment and Gross Domestic Investment Promote Economic Growth?," R*eview of Development Economics*, 7(1): 44-57.

Chudnovsky, Daniel and Andrés López (2004), "Transnational Corporations' Strategies and Foreign Trade Patterns in MERCOSUR Countries in the 1990s," *Cambridge Journal of Economics*, 28(5): 635–652.

Chudnovsky, Daniel, A. Lopez, and G. Rossi (2008), "Foreign Direct Investment Spillovers and the Absorptive Capabilities of Domestic Firms in the Argentinean Manufacturing Sector (1992-2001)," *Journal of Development Studies*, 44(5): 645-677.

Clerides, Sofronis K., Saul Lach, and James R. Tybout (1998), "Is Learning by Exporting Important? Micro-Dynamic Evidence from Colombia, Mexico, and Morocco," *The Quarterly Journal of Economics*, 113(3): 903-947.

Coase, Ronald Harry (1937), "The Nature of the Firm," *Economica*, New Series, 4(16): 386-405.

Coase, Ronald Harry (1990), *The Firm, the Market and the Law*, Chicago: The University of Chicago Press.

Coe, David T. and Elhanan Helpman (1995), "International R&D Spillovers," *European Economic Review*, 39(5): 859-887.

Coe, David T., E. Helpman and A. Hoffmaister (1997), "North-South R&D Spillovers," *Economic Journal*, 107(440): 134-149.

Coe, David T., E. Helpman and A. Hoffmaister (2008), "International R&D Spillovers and Institutions," *IMF Working Paper*, WP/08/104.

Cohen, D. L. and M. A. Tribe (1972), "Suppliers' Credits in Ghana and Uganda - An Aspect of the Imperialist System," *The Journal of Modern African Studies*, 10(4): 525-541.

Cohen, W. and D. A. Levinthal (1989), "Innovation and Learning: the Two Faces of R&D," *Economic Journal*, 99(397): 569-596.

Cohen, W. and D. A. Levinthal (1990), "Absorptive Capacity: a New Perspective on Learning and Innovation," *Administrative Science Quarterly*, 35(1): 128-152.

Collier, Paul and Jan Willem Gunning (1999), "Why Has Africa Grown Slowly?," *The Journal of Economic Perspectives*, 13(3): 3-22.

Collins, W. J., K. H. O'Rourke and J. G. Williamson (1997), "Were Trade and Factor Mobility Substitutes in History?" *NBER Working Paper*, No. 6059.

Crespo, Nuno and Maria Paula Fontoura (2007), "Determinant Factors of FDI Spillovers - What Do We Really Know?," *World Development*, 35(3): 410-425.

Dadush, U., D. Dasgupta and D. Ratha (2000), "The Role of Short-Term Debt in Recent Crises," *Finance and Development*, 37(4).

Dahlman, C.J. and L. E. Westphal (1981), "The managing of technological mastery in relation to transfer of technology," *Annals of the American Academy of Political and Social Science*, 458(November): 12-26.

Das, Saghamitra (1987), "Externalities and Technology Transfer through Multinational Corporations," *Journal of International Economics*, 22(1-2): 171-182.

Davenport, Thomas H. and Laurence Prusak (1998), *Working Knowledge: How Organizations Manage What They Know*, Boston, Massachusetts: Harvard Business School Press.

De Gregorio, José (1992), "Economic Growth in Latin America," *Journal of Development Economics*, 39(1): 58-84.

De Gregorio, José (2003), "The Role of Foreign Direct Investment and Natural Resources in Economic Development," *Central Bank of Chile Working Papers*, No. 196.

De Mello, L. R. (1999), "Foreign Direct Investment-led Growth: Evidence from Time Series and Panel Data," *Oxford Economic Papers*, 51(1): 133-151.

Desmond, Margaret (2004), "Methodological Challenges Posed in Studying an Elite in the Field," *Area*, 36(3): 262-269.

Dhawan, Rajeev (2001), "Firm Size and Productivity Differential: Theory and Evidence from a Panel of US Firms," *Journal of Economic Behaviour and Organization*, 44(2001): 269–293.

Divestiture Implementation Committee (2008), "The Divestiture Programme in Ghana," http://www.dic.com.gh/div-prog/index.html (accessed on June 2009).

Djankov, Simeon and Bernard Hoekman (2000), "Foreign Investment and Productivity Growth in Czech Enterprises," *World Bank Economic Review*, 14(1): 49–64.

Donkor, Kwabena (1997), *Structural Adjustment and Mass Poverty in Ghana*, Aldershot: Ashgate.

Dosi, Giovanni, Christopher Freeman, Richard Nelson, Gerald Silverberg and Luc L. Soete (1988), *Technical Change and Economic Theory*, London and New York: Pinter Publishers.

Dovlo, Delanyo (2003), *The Brain Drain and Retention of Health Professionals in Africa*, A case study report prepared for a Regional Training Conference on Improving Tertiary Education in Sub-Saharan Africa: Things That Work! Accra, September 23-25, 2003.

Dunning, John H. (1958), *American Investment in British Manufacturing Industry*, London: Allen and Unwin.

Dunning, John H. (1972), *The Location of International Firms in an Enlarged EEC: An Exploratory Paper*, Manchester: Manchester Statistical Society.

Dunning, John H. (1973), "The Determinants of International Production," *Oxford Economic Papers*, New Series, 25(3): 289-336.

Dunning, John H. (1977), "Trade, Location of Economic Activity and the MNE: A search for an Eclectic Approach," In B., Ohlin, P. O. Hasselborn, and P. M. Wijkman (eds.), *The International Allocation of Economic Activity: Proceedings of a Nobel Symposium held at Stockholm*, London: Macmillan, pp. 395-418.

Dunning, John H. (1993a), *Multinational Enterprises and the Global Economy*, Wokingham, Berkshire: Addison-Wesley.

Dunning, John H. (1993b), *The Globalization of Business: The Challenge of the 1990s*, London and New York: Routledge.

Dunning, John H. (1994), "Consequences of the international transfer of technology by MNEs: a home country perspectives," In E. Chen and J. Dunning (eds.),

Technology transfer to developing countries. UNCTAD, New York: Routledge, pp: 86-125.

Dunning, John H. (1996), "The Nature of Transnational Corporations and their Activities," In *Transnational Corporations and World Development*, London: International Thompson Business Press (on behalf of UNCTAD Division on Transnational Corporations and Investment), pp: 27-43.

Dunning, John H. (2001a), "The Key Literature on IB Activities: 1960 – 2000," In Alan M. Rugman, and Thomas L. Brewer (eds.), *The Oxford Handbook of International Business*, Oxford: Oxford University Press, pp.36-68.

Dunning, John H. (2001b), "The Eclectic (OLI) Paradigm on International Production: Past, Present and Future," *International Journal of the Economics of Business*, 8(2): 173-190.

Dunning, John H. and Sarianna M. Lundan (2008), *Multinational Enterprises and the Global Economy*, 2nd Ed. Cheltenham: Edward Elgar.

Eaton, Jonathan and Samuel Kortum (1996), "Trade in Ideas, Patenting, and Productivity in the OECD," *Journal of International Economics*, 40(3-4): 251-78.

Edfelt, Ralph B. (1975), *Direct Investment in a Developing Economy: Towards Evaluating the Human Resource Development Impact in Brazil*, (Unpublished PhD dissertation), University of California, Los Angeles.

Eggertsson, Thrainn (1992), *Economic Behaviour and Institutions*, New York: Cambridge University Press.

Ekholm, K., R. Forslid and J. R. Markusen (2003), "Export-Platform Foreign Direct Investment," *NBER Working Paper*, No. 9517.

Elson, D. (1999), "Theories of Development," In M. Lewis and J. Peterson (eds.), *The Elgar Companion to Feminist Economics*, Cheltenham, England: Edward

Enos, J. L. (1989), "Transfer of Technology," *Asian-Pacific Economic Literature*, 3(1): 2-36.

Enos, J. L. (1995), *In Pursuit of Science and Technology in Sub-Saharan Africa: The Impact of Structural Adjustment Programmes*, London and New York: Routledge in association with the UNU Press.

Erdilek, A. and A Rapoport (1985), "Conceptual and Measurement Problems in International Technology Transfer: a Critical Analysis," In A. C. Samli (ed.), *Technology Transfer: Geographic, Economic, Cultural and Technical Dimensions*, (Westport, Connecticut: Quorum Books), pp; 231-248.

Ethier, Wilfred J. (1986), "The Multinational Firm," *The Quarterly Journal of Economics*, 101(4): 805-33.

Evenson, Robert E. and Larry E. Westphal (1995), "Technological Change and Technology Strategy," In J. Behrman and T.N. Srinivasan (eds.), *Handbook of Development Economics*, Vol. IlI, Elsevier Science.

Ewusi, Kodwo (1987), *Structural Adjustment and Stabilization Policies in Developing countries: a case study of Ghana's experience, 1983-1986,* Tema, Ghana : Ghana Publishing Corporation.

Ewusi, Kodwo (1989), *The Impact of Structural Adjustment on the Agricultural Sector in Ghana,* Legon, Ghana: Institute of Statistical, Social and Economic Research, University of Ghana.

Fafchamps, M., S. El Hamine and A. Zeufack (2002), "Learning to Export: Evidence from Moroccan Manufacturing," *CSAE Working Paper,* WPS/2002-02.

Falvey, Rodney E. (1976), "A Note on Quantitative Restrictions and Capital Mobility," *American Economic Review,* 66(1): 217-220.

Feenstra, R. C. (2004), *Advanced International Trade: Theory and Evidence*, Princeton, New Jersey: Princeton University Press.

Feenstra, R. C., J. R. Markusen and W. Zeile (1992), "Accounting for Growth with New Inputs: Theory and Evidence," *American Economic Review*, 82(2): 415-421.

Findlay, Ronald (1978), "Relative Backwardness, Direct Foreign Investment and the Transfer of Technology: A Simple Dynamic Model," *Quarterly Journal of Economics,* 68(2): 1-16.

Fink, Arlene (2003), *How to Sample in Surveys,* 2nd ed., London: SAGE Publications.

Flatters, Frank (1972), "Commodity Price Equalization: A Note on Factor Mobility and Trade", *The American Economic Review*, Vol. 62, No. 3, pp. 473 – 476.

Flowers, Edward B. (1976), "Oligopolistic reaction in European and Canadian direct investment in the United States," *Journal of International Business Studies*, 7(2): 43-55.

Fosfuri, Andrea, Massimo Motta and Thomas Rønde (1999), "Foreign Direct Investment and Spillovers through Workers' Mobility," *Centre for Economic Policy Research Discussion Paper* No. 2194.

Frank, Isaiah (1980), *Foreign Enterprise in Developing Countries,* Baltimore, Maryland: The Johns Hopkins University Press.

Freeman, Christopher and Luc Soete (1997), *The Economics of Industrial Innovations,* 3rd Edition. London and New York: Routledge.

Frimpong-Ansah, Jonathan H. (1991), *The Vampire State in Africa: The Political Economy of Decline in Ghana*, London: James Currey.

Fu, X., C. Pietrobelli and L. Soete (2011), "The Role of Foreign Technology and Indigenous Innovation in the Emerging Economies: Technological Change and the Catching-up," *World Development*, 39(7): 1204-1212.

Gallini, N. (1984), "Deterrence through Market Sharing: A strategic Incentive for Licencing," *American Economic Review*, 74(5): 931-941.

Gallini, N. and B. D. Wright (1990), "Technology Transfer under Asymmetric Information," *Rand Journal of Economics*, 21(1): 147-160.

Gallini, N. and R. Winter (1985), "Licencing in the Theory of Innovation," *Rand Journal of Economics*, 16(2): 237-252.

Gastanaga, V., J. B. Nugent and B. Pashmamova (1998), "Host Country Reforms and FDI Inflows: How Much Difference do they Make?," *World Development*, 26(7): 1299-1314.

Gereffi, Gary (1994), "The Organization of Buyer-driven Global Commodity Chains: How U.S. Retailers Shape Overseas Production Networks," In Gereffi, G. and Korzeniewicz, M. (eds.), *Commodity Chains and Global Capitalism*, Westport, CT: Praeger, pp. 95-122.

Gereffi, G. and M. Korzeniewicz (1994), *Commodity Chains and Global Capitalism*, Westport, CT: Praeger.

Gereffi, G., J. Humphrey and T. Sturgeon (2005), "The Governance of Global Value Chains," *Review of International Political Economy*, 11(1): 13-33.

Gerschenberg, Irvin (1987), "The Training and Spread of Managerial Know-How, A Comparative Analysis of Multinational and Other Firms in Kenya," *World Development*, 15(7): 931-937.

Ghana Chamber of Mines (2008), *Ghana Chamber of Mines, First Half-Year: 2008 Performance*, Accra: Ghana Chamber of Mines.

Ghana Chamber of Mines (2008), *Performance of the Ghana Mining Industry in 2007*, Accra: Ghana Chamber of Mines.

Ghana Free Zones Board (2009), *Incentives for Investing In Ghana*, http://www.gfzb.gov.gh/live/investment%20opportunity/incentives.php (accessed on 14th August 2009).

Ghana Investment Promotion Centre (2007), *GIPC First Quarterly Report (2007)*. Accra: Ghana Investment Promotion Centre.

Ghana Investment Promotion Centre (2007), *GIPC Fourth Quarterly Report (2007)*, Accra: Ghana Investment Promotion Centre.

Ghana Investment Promotion Centre (2008), *GIPC 2008 First Quarterly Report*, Accra: Ghana Investment Promotion Centre.

Ghana Investment Promotion Centre (2008), *GIPC Fourth Quarterly Report (2008)*, Accra: Ghana Investment Promotion Centre.

Ghana Investment Promotion Centre (2009), *GIPC Fourth Quarterly Report (2009)*, Accra: Ghana Investment Promotion Centre.

Ghana Investment Promotion Centre (2009), *GIPC Second Quarterly Report (2009)*, Accra: Ghana Investment Promotion Centre.

Ghana Investment Promotion Centre (2009), *GIPC Third Quarterly Report (2009)*, Accra: Ghana Investment Promotion Centre.

Ghana Investment Promotion Centre (2010), *GIPC First Quarterly Report (2010)*, Accra: Ghana Investment Promotion Centre.

Ghana Investment Promotion Centre (2011), GIPC 2010 Fourth Quarterly Report, Accra: Ghana Investment Promotion Centre.

Ghana Investment Promotion Centre (2011), *GIPC 2010 Fourth Quarterly Report*, Accra: Ghana Investment Promotion Centre.

Ghana Minerals Commission (2010), *The Minerals Commission of Ghana Pamphlet on the Mining Sector*, Accra: Minerals Commission.

Ghana Statistical Service (1983), *Economic Survey*, various issues, Accra: Ghana Statistical Service.

Ghana Statistical Service (2004), *Quarterly Digest of Statistics*, various issues, Accra: Ghana Statistical Service.

Ghana Statistical Service (2009), *GDP Newsletter 2008*, Accra: Ghana Statistical Service.

Ghana Stock Exchange (2011), *Performance of the Ghana Stock Exchange*, available on http://www.gse.com.gh/index1.php?linkid=1.

Gilbert, Melissa (1994), "The politics of Location: Doing Feminist Research at 'Home'," *Professional Geographer*, 46(1): 90-96.

Gillman, Bill (2000), *Developing a Questionnaire*, London: Continuum.

Girma, S. and H. Görg (2007), "Evaluating the Foreign Ownership Wage Premium using a Difference-in-Difference Matching Approach," *Journal of International Economics*, 72(1): 97-112.

Glass, Amy Jocelyn and Kamal Saggi (1998), "International Technology Transfer and the Technology Gap," *Journal of Development Economics*, 55(2): 369-398.

Glass, Amy Jocelyn and Kamal Saggi (1999), "Foreign Direct Investment and the Nature of R&D," *Canadian Journal of Economics*, 32(1): 92-117.

Glass, Amy Jocelyn and Kamal Saggi (2002), "Multinational Firms and Technology Transfer," *Scandinavian Journal of Economics*, 104(4): 495-513.

Gocking, Roger S. (2005), *The History of Ghana*, Greenwood, Connecticut: Greenwood Press.

Goldin, Nicole R. (2005), *Uncovering the Dynamics Between Large and Small Enterprises in Employment Generation and Firm Sustainability: Evidence from Maputo, Mozambique*, (Unpublished PhD Thesis), School of Oriental and African Studies, University of London.

Golub, Stephen S. (2009), "Openness to Foreign Direct Investment in Services: An International Comparative Analysis," *The World Economy*, 32(8): 1245–1268.

Goncalves, Reinaldo (1986), "Technological Spillovers and Manpower Training: A Comparative Analysis of Multinational and National Enterprises in Brazilian Manufacturing," *Journal of Development Economics*, 11(1): 119–32.

Gorg, H. and D. Greenaway (2004), "Much Ado About Nothing? Do Domestic Firms really Benefit from Foreign Direct Investment?," *World Bank Research Observer*, 19(2): 171-197.

Görg, Holger and Eric Strobl (2005), "Spillovers from Foreign Firms through Worker Mobility: An Empirical Investigation," *Scandinavian Journal of Economics*, 107(4): 693-709r.

Government of Ghana (1959), *The Pioneer Industries and Companies Act, 1959*, Accra: Government Printing Department.

Government of Ghana (1960), *Annual Volume of the Act of Ghana Enacted during the Year 1959 and First Half-Year 1960*, pp. 317-322, Accra: Government Printers.

Government of Ghana (1960), *The Pioneer Industries and Companies (Amendment) Act, 1960*, Accra: Government Printing Department.

Government of Ghana (1963), *The Capital Investments Act, 1963*, Accra: Government Printing Department.

Government of Ghana (1965), *The Capital Investments (Amendment) Act, 1965*, Accra: Government Printing Department.

Government of Ghana (1975), *Investment Policy (Amendment) Decree, 1975*, Accra: Ghana Publishing Corporation.

Government of Ghana (1976), *Investment Policy (Amendment) (No. 2) Decree, 1976*, Accra: Ghana Publishing Corporation.

Government of Ghana (1976), *Investment Policy (Amendment) (No. 3) Decree, 1976*, Accra: Ghana Publishing Corporation.

Government of Ghana (1976), *Investment Policy (Amendment) Decree, 1976*, Accra: Ghana Publishing Corporation.

Government of Ghana (1995), *The Free Zone Act, 1995*, Accra: Ghana Publishing Company.

Government of Ghana (1997), *Ghana – Vision 2020: The First Step – 1996 - 2000*, Accra: National Development Planning Commission.

Government of Ghana (2010), *Medium-Term National Development Policy Framework: Ghana Shared Growth and Development Agenda 2010-2013*, Accra: National Development Planning Commission.

Government of Ghana (2010), *The Coordinated Programme of Economic and Social Development Policies, 2010 – 2016: An Agenda for Shared Growth and*

Accelerated Development for a Better Ghana, Accra: National Development Planning Commission.

Graham, Edward M. (1995), "Foreign Direct Investment in the World Economy," *IMF Working Paper*, No. WP/95/59, Washington D.C.: International Monetary Fund.

Graham, Edward M. and Paul R. Krugman (1995). *Foreign Direct Investment in the United States*, Washington D.C.: Institute for International Economics.

Gray, H. P. (1998), "International Trade and Foreign Direct Investment: The Interface." In J. H. Dunnung (ed.) *Globalisation, Trade and Foreign Direct Investment*, Oxford: Elsevier, pp. 19-27.

Grayson, Leslie E. (1971), "Ghanaian Industrial Strategy: Some Problems for the 1970s," *The Economic Bulletin of Ghana*, 2nd Series, 1(3): 3-23.

Grayson, Leslie E. (1974), "Manufacturing Development in Ghana, 1920 - 1975," *The Economic Bulletin of Ghana*, 2nd Series, 4, (3/4): 61-86.

Greenaway, David, Nuno Sousa and Katharine Wakelin (2004), "Do Indigenous Firms Learn to Export from Multinationals?," European Journal of Political Economy, 20(4): 1027-1043.

Greenaway, D., D. Sapsford and S. Pfeffenzeller (2007), "Foreign Direct Investment, Economic Performance and Trade Liberalisation," *The World Economy*, 30(2): 197-210.

Griffith, Rachel, Stephen Redding and John Van Reenen (2000), "R&D and Absorptive Capacity: From Theory to Data," *Institute of Fiscal Studies Working Paper*, No. 01/03.

Grossman, Gene M. and Elhanan Helpman (1991), *Innovation and Growth in the Global Economy*, Cambridge, Massachusetts: The MIT Press.

Grossman, Gene M. and Elhanan Helpman (1994), "Technology and Trade," *NBER Working Paper*, No. 4926.

Gyimah-Brimpong, K. and Thomas L. Traynor (1999), "Political Instability, Investment and Economic Growth in Sub-Saharan Africa," *Journal of African Economies*, 8(1): 52-86.

Haddad, Mona and Ann Harrison (1993), "Are there Positive Spillovers from Direct Foreign Investment? Evidence from Panel Data for Morocco," *Journal of Development Economics*, 42(1): 51-74.

Hakam, A. N. (1972), "Impediments to the Growth of Indigenous Industrial Entrepreneurship in Ghana, 1946-1968," *Economic Bulletin of Ghana*, 2(2): 3-31.

Hall, Bronwyn and Beethika Khan (2003), "Adoption of New Technology," *NBER Working Paper*, No. 9730.

Hall, Bronwyn and Christian Helmers (2010), "The Role of Patent Protection in (clean/green) Technology Transfer," *UNU-MERIT Working Papers* No.2010-046.

Hall, Bronwyn H. (2011), "Innovation and Productivity," *UNU-MERIT Working Paper Series*, No. 2011-028.

Hansen, Henrik and John Rand (2006), "On the Causal Links Between FDI and Growth in Developing Countries," *The World Economy*, 29(1): 21-41.

Hansen, M. W., T. Pedersen and B. Petersen (2007), *MNC Strategies and Linkage Effects in Developing Countries*, Centre for Strategic Management and Globalisation, Copenhagen Business School SMG WP 2/2007.

Hanson, Gordon H. (2001), "Should Countries Promote Foreign Direct Investment?," *G-24 Discussion Paper Series*, No. 9, New York and Geneva: UNCTAD.

Harrison, Ann (1994a), "The Benefits of FDI," *The Columbian Journal of World Business*, (Winter 1994): 6-11.

Harrison, Ann (1994b), "The Role of Multinationals in Economic Development: The Benefits of FDI," *The Columbia Journal of World Business*, 29(4): 6-11.

Harvey, Simon K. and Joshua Abor (2009), "Determinants of Inward Foreign Direct Investment in the Ghanaian Manufacturing Sector," *Global Business and Economics Review*, 11(2): 180-197.

Hausmann, Ricardo and Dani Rodrik (2003), "Economic Development as Self-discovery," *Journal of Development Economics*, 72(2): 603-633.

Helpman, E., M. J. Melitz and S. R. Yeaple (2003), "Export versus FDI," *NBER Working Paper*, No. 9439.

Helpman E., M. J. Melitz, S. R. Yeaple (2004), "Export versus FDI with Heterogeneous Firms," *The American Economic Review*, 94(1): 300-316.

Helpman, Elhanan (1984), "A Simple Theory of International Trade with Multinational Corporations," *Journal of Political Economy*, 92(3): 451-71.

Helpman, Elhanan (1985), "Multinational Corporations and Trade Structure," *Review of Economic Studies*, 52(3): 443-457.

Helpman, Elhanan (2006), "Trade, FDI and the Organisation of Firms," *NBER Working Paper*, No. 12091.

Helpman, Elhanan and Paul Krugman (1985), *Market Structure and Foreign Trade*, Cambridge, M.A.: The MIT Press.

Hennart, Jean-Francois (1982), A Theory of Multinational Enterprise, University of Michigan Press.

Hennart, Jean-Francois (2009), "Theories of the Multinational Enterprise," In Alan M. Rugman (ed.), *The Oxford Handbook of International Business*, 2nd Ed., Oxford: Oxford University Press, pp: 125-145.

Hodgson, Geoffrey M. (2002), "The Legal Nature of the Firm and the Myth of the Firm-Market Hybrid," *International Journal of the Economics of Business*, 9(1): 37-60.

Hopkins, Peter E. (2007), "Positionalities and Knowledge: Negotiating Ethics in Practice," *ACME: An International E-Journal for Critical Geographies*, 6(3): 386-394.

Horstmann, Ignatius and James R. Markusen (1987), "Licencing versus Direct Investment: A Model of Internalization by the Multinational Enterprise," *Canadian Journal of Economics*, 20(3): 464-81.

Horstmann, Ignatius J. and James Markusen (1992), "Endogenous market structures in international trade (natura facit saltum)," *Journal of International Economics*, 32(1-2): 109-129.

Hsiao, F. S. T. and M-C. W. Hsaio (2006), "FDI, exports and growth in East and Southeast Asia-Evidence from time-series and panel data causality analyses," Paper presented at 2006 International Conference on Korea and the World Economy V, July 7-8 2006 at Korea University, Seoul, Korea.

Huang, C., A. Arundel and H. Hollanders (2010), "How Firms Innovate: R&D, Non-R&D, and Technology Adoption," *UNU-MERIT Working Papers* No. 2010-027.

Huq, M. M. (1989), *The Economy of Ghana: The First 25 Years since Independence*, London: The Macmillan Press Ltd.

Hutchful, Eboe (2002), *Ghana's Adjustment Experience: The Paradox of Reform*, Geneva: United Nations Research Institute for Social Development (UNRISD).

Hymer, Stephen H. (1960), *The International Operations of National Firms: A Study of Direct Foreign Investment*, (Unpublished PhD. Thesis), Boston: MIT (published posthumously by the MIT Press in 1976).

Hymer, Stephen H. (1972), "The Internationalization of Capital," *The Journal of Economic Issues*, 6(1): 91-111.

Hymer, Stephen H. (1975), "The Multinational Corporation and the Law of Uneven Development," In Hugo Radice (ed.), *International Firms and Modern Imperialism*, Harmondsworth, Middlesex: Penguin, pp: 37-62.

Ingham, Geoffrey K. (1970), *Size of Industrial Organisation and Worker Behaviour*, Cambridge, UK: Cambridge University Press.

International Monetary Fund (1993), *Balance of Payments Manual*, 5th Edition, Washington, DC: International Monetary Fund.

Jackson, Peter (1993), "Changing ourselves: A geography of position," In R. J. Johnston, (ed), *The Challenge for Geography, A Changing World: A Changing Discipline*, Oxford: Blackwell Publishers.

Javorcik, Beata Smarzynska (2004), "Does Foreign Direct Investment Increase the Productivity of Domestic Firms? In Search of Spillovers through Backward Linkages," *The American Economic Review*, 94(3): 605-627.

Jebuni, C. D., A. Oduro, Y. Asante and G.K. Tsikata (1992), *Diversifying Exports: The Supply Response of Non-Traditional Exports to Ghana's Economic Recovery Programme*, London: Overseas Development Institute.

Jensen, Nathan M. (2008), *Nation-States and the Multinational Corporation: A Political Economy of Foreign Direct Investment*, Princeton, New Jersey: Princeton University Press.

Jian-Ye Wang and Abdoulaye Bio-Tchané (2008), "Africa's Burgeoning Ties with China," *Finance and Development*, 45(1).

Johnson, Andreas (2006), "The Effects of FDI Inflows on Host Country Economic Growth," *Centre of Excellence for Studies in Science and Innovation Working Paper Series*, No. 58.

Jolliffe, F. R. (1986), *Survey Design and Analysis*, Chichester, West Sussex: Ellis Horwood Ltd.

Jones, Geoffrey (2005), *Multinationals and Global Capitalism; From the Nineteenth to the Twenty-first Century*, Oxford, U.K.: Oxford University Press.

Kabiraj, Tarun and Sugata Marjit (1993), "International Technology Transfer under Potential Threat of Entry: A Cournot-Nash Framework," *Journal of Development Economics*, 42(1): 75-88.

Kaldor, Nicholas (1967), *Strategic Factors in Economic Development*, Ithaca, New York: Cornell University.

Kalton, Graham (1983), *Introduction to Survey Sampling*, London: SAGE Publications.

Kaplinsky, Raphael and Mike Morris (2009), "Chinese FDI in Sub-Saharan Africa: Engaging with Large Dragons," *European Journal of Development Research*, 21(4): 551-569.

Kapur, I., M. T. Hadjimichael, P. L. Hilbers, J. A. Schiff and P. Szymczak (eds.) (1991), *Ghana: Adjustment and Growth, 1983-91*, Washington DC: International Monetary Fund.

Katsouris, Christina (1998), "Steady Progress on Privatization: Stock Market Becomes Third Largest on the Continent," *African Recovery*, 11(3): 6.

Katz, M. and C. Shapiro (1985), "On the Licensing of Innovations," *Rand Journal of Economics*, 16(4): 504-520.

Katz, M. and C. Shapiro (1986), "How to Licence intangible property," *Quarterly Journal of Economics*, 101(3): 567-589.

Keller, Wolfgang (1996), "Absoptive Capacity: On the creation and acquisition of technology in Development," *Journal of Development Economics*, 49(1): 199-227.

Keller, Wolfgang (1996), "Trade and the Transmission of Technology," *University of Wisconsin-Madison, Department of Economics Working Paper*.

Keller, Wolfgang (1998), "Are International R&D Spillovers Trade Related? Analysing spillovers among randomly matched trade partners," *European Economic Review*, 42(8): 1469-1481.

Keller, Wolfgang (2000), "Do Trade Patterns and Technology Flows Affect Productivity Growth?," *The World Bank Economic Review*, 14(1): 17-47.

Keller, Wolfgang (2001), "Trade and the Transmission of Technology," *University Texas, Department of Economics Working Paper*.

Keller, Wolfgang (2004), "International Technology Diffusion," *Journal of Economic Literature*, 42(3): 752-782.

Keller, Wolfgang (2009), "International Trade, Foreign Direct Investment, and Technology Spillovers," *NBER Working Paper Series*, No. 15442.

Killick, Tony (1983), "Development Planning in Africa: Experiences, Weaknesses and Prescriptions," *Development Policy Review*, 1(1): 47-76.

Killick, Tony (2000), "Fragile Still? The Structure of Ghana's Economy, 1960-1994," In Aryeetey E., J. Harrigan and M. Nissanke (eds). *Economic Reforms in Ghana: The Miracle and the Mirage*. London: James Currey, pp: 51-67.

Killick, Tony (2010), *Development Economics in Action: A Study of Economic Policies in Ghana*, 2nd Edition. London and New York: Routledge.

Kim, Linsu (1997), *Imitation to Innovation: The Dynamics of Korea's Technological Learning*, Boston: Harvard Business School Press.

Kim, Linsu and Richard R. Nelson (2000), "Introduction," In Linsu Kim and Richard R. Nelson (eds.), *Technology, Learning and Innovation: Experiences of Newly Industrializing Economies*, Cambridge, U.K.: Cambridge University Press, pp: 1-12.

Kindleberger, C. P. (1969), *American Business Abroad*, New Haven: Yale University Press.

Kinishita, Yuko and Chia-Hui Lu (2006), "On the Role of Absorptive Capacity: FDI Matters to Growth," *William Davidson Institute Working* Paper Number 845.

Kitching, Gavin N. (1982), *Development and Underdevelopment in Historical Perspective: Populism, Nationalism and Industrialisation*, London and New York: Methuen.

Knickerbroker, F. T. (1973), *Oligopolistic Reaction and the Multinational Enterprise*, Cambridge, MA: Harvard University Press.

Koizumi, Tetsunori and Kenneth J. Kopecky (1977), "Economic Growth, Capital Movements and the International Transfer of Technical Knowledge," *Journal of International Economics*, 7(1): 45-65.

Kokko, Ari (1994), "Technology, Market Characteristics, and Spillovers," *Journal of Development Economics*, 43(2): 279-293.

Kokko, Ari and Magnus Blomström (1995), "Policies to Encourage Inflows of Technology Through Foreign Multinationals," *World Development*, 23(3): 459-468.

Kokko, Ari, Mario Zejan, and Ruben Tansini (2001), "Trade Regimes and Spillover Effects of FDI: Evidence from Uruguay," *Review of World Economics*, 137(1): 124–149.

Konadu-Agyeman, Kwadwo (ed.) (2001), *IMF and World Bank Sponsored Structural Adjustment Programs in Africa: Ghana's Experience, 1983-1999*, Aldershot: Ashgage.

Konishita, Yuko (2001), "R&D and Technology Spillovers through FDI: Innovation and Absorptive Capacity," *CEPR Discussion Paper* No. 2775.

Kozul-Wright, R. and Rowthorn, R. (1998), "Spoilt for Choice? Multinational Spoilt for choice? Multinational Corporations and the Geography of International Production," *Oxford Review of Economic Policy*, 14(2): 74-92.

Krugman, Paul R. (1979), "Increasing Returns, Monopolistic Competition, and International Trade," *Journal of International Economics*, 9(4): 469-79.

Kumar, N. and N. S. Siddharthan (1994), "Technology, Firm Size and Export Behaviour in Developing Countries: The Case of Indian Enterprises," *Journal of Development Studies*, 31(2): 289-309.

Lall, S., G. B. Navaretti, S. Teitel and G. Wignaraja (1994), *Technological and Enterprise Development: Ghana under Structural Adjustment*, London: Macmillan.

Lall, Sanjaya (1974), "Less-Developed Countries and Private Foreign Direct Investment: A Review Article," *World Development*, 2(4-5): 43-48.

Lall, Sanjaya (1978), "Transnationals, Domestic Enterprises, and Industrial Structure in Host LDCs: A Survey," *Oxford Economic Papers*, 30(2): 217-248.

Lall, Sanjaya (1980), "Vertical Inter-Firm Linkages in LDCs: An Empirical Study," *Oxford Bulletin of Economics and Statistics*, 42(3): 203-226.

Lall, Sanjaya (2000), "The Technological Structure and Performance of Developing Country Manufactured Exports, 1985-1998," *QEH Working Paper Series* No. 44.

Lall, Sanjaya (2003), "FDI, AGOA and Manufactured Exports from a Land-Locked, Least-Developed African Economy: Lesotho," *QEH Working Paper Series* – QEHWPS109.

Lall, Sanjaya and Rajneesh Narula (2004), "FDI and Its Role in Economic Development: Do we Need a New Agenda," *MERIT-Infonomics Research Memorandum Series*, No. 2004-019.

Laryea, Ken (1990), "Recent Investment Legislation in Ghana," *International and Comparative Law Quarterly*, 39(1): 197-205.

Lee, Frank C. and Oz Shy (1992), "A Welfare Evaluation of Technology Transfer to Joint Ventures in Developing Countries," *The International Trade Journal*, 7(2): 205-220.

Leith, Clark J. and Ludvig Söderling (2003), *Ghana - Long term Growth: Atrophy and Stunted recovery*, Uppsala: Nordiska Afrikainstitutet.

Lemi, Adugna (2004), "Foreign Direct Investment, Host Country Productivity and Export: The Case of U.S. and Japanese Multinational Affiliates," *Journal of Economic Development*, 29(1): 163-187.

Lewis, W. A. (1953), *Report on Industrialisation and the Gold Coast*, Accra: Government Printing Department.

Li, Xiaoying and Xiaming Liu (2005), "Foreign Direct Investment and Economic Growth: An Increasingly Endogenous Relationship," *World Development*, 33(3): 393-407.

Liedholm, C., M. McPherson, E. Chuta (1994), "Small Enterprise Employment Growth in Rural Africa," *American Journal of Agricultural Economics; Proceedings Issue*, 76(5): 1177-1182.

Lin, Chinho, Bertram Tan and Shofang Chang (2002), "The Critical Factors for Technology Absorptive Capacity," *Industrial Management and Data Systems*, 102(6): 300-308.

Lin, Ping and Kamal Saggi (2005), "Multinational Firms, Exclusivity, and the Degree of Backward Linkages," *Deutsche Bundesbank Discussion Paper Series 1: Economic Studies*, No. 10/2005.

Linda S. Goldberg and Michael W. Klein (1997), "Foreign Direct Investment, Trade and Real Exchange Rate Linkages in Developing Countries," *NBER Working Papers*, No. 6344.

Linda S. Goldberg and Michael W. Klein (1999), "International Trade and Factor Mobility: An Empirical Investigation," *NBER Working Papers*, No. 7196.

Lipsey, Robert E. (2001a), "Foreign Direct Investors in Three Financial Crises," *NBER Working Paper*, No. 8084 (Cambridge, Massachusetts: National Bureau of Economic Research).

Lipsey, Robert E. (2001b), "Foreign Direct Investment and the Operations of Multinational Firms: Concepts, History, and Data," *NBER Working Paper*, No. 8665.

Lipsey, Robert E. (2004), "Home- and Host-Country Effects of Foreign Direct Investment," *NBER Working Paper*, No. w9293.

Lipsey, Robert E. and Fredrik Sjoholm (2003), "Foreign Firms and Indonesian Manufacturing Wages: An Analysis with Panel Data," *NBER Working Papers* No. 9417.

Liu, Zhiqiang (2008), "Foreign Direct Investment and Technology Spillovers: Theory and Evidence," *Journal of Development Economics*, 85(1-2): 176-193.

Loungani, Prakash and Assaf Razin (2001), "How Beneficial Is Foreign Direct Investment in Developing Countries?," *Finance and Development*, 38(2): 6-10.

Magdoff, H. (1969), *The Age of Imperialism*, New York: Monthly Review Press.

Mairesse, J. and P. Mohnen (2010), "Using Innovation Surveys for Econometric Analysis," *UNU-MERIT Working Paper Series*, No. 2010-023.

Mansfield, E. and A. Romeo (1980), "Technology Transfer to Overseas Subsidiaries by U.S.-Based Firms," *The Quarterly Journal of Economics*, 95(4): 737-750.

Mariotti, S., M. Mutinelli and L. Piscitello (2003), "Home Country Employment and Foreign Direct Investment: Evidence from the Italian Case," *Cambridge Journal of Economics* 27(3): 419-431.

Markusen, J. R. (1983), "Factor Movements and Commodity Trade as Complements", *Journal of International Economics*, Vol. 14, Issues 3-4, pp. 341-356.

Markusen, J. R. (1984), "Multinationals, Multi-plant Economies, and the Gains from Trade," *Journal of International Economics*, 16(3-4): 205-26.

Markusen, J. R. (1988), "Production, Trade, and Migration with Differentiated, Skilled Workers," *Canadian Journal of Economics*, 21(3): 492-506.

Markusen, J. R. (1995), "The Boundaries of Multinational Enterprises and the Theory of International Trade," *Journal of Economic Perspectives*, 9(2): 169-189.

Markusen, J. R. (2002), *Multinational Firms and the Theory of International Trade*, Cambridge, Massachusetts: The MIT Press.

Markusen, J. R. and A. J. Venables (1997), "The Role of Multinational Firms in the Wage-Gap Debate," *Review of International Economics*, 5(4): 435-51.

Markusen, J. R. and A. J. Venables (1998), "Multinational Firms and the New Trade Theory," *Journal of International Economics*, 46(2): 183-203.

Markusen, J. R. and A. J. Venables (1999), "Foreign Direct Investment as a Catalyst for Industrial Development," *European Economic Review*, 43(2): 335–356.

Markusen, J. R. and A. J. Venables (2000), "The Theory of Endowment, Intra-industry and Multi-national trade," *Journal of International Economics*, 52(2): 209-234.

Markusen, J. R. and K. E. Maskus (2002), "Discriminating among Alternative Theories of the Multinational Enterprise," *Review of International Economics*, 10(4): 694-707.

Markusen, J. R. and N. Trofimenko (2009), "Teaching Locals New Tricks: Foreign Experts as a Channel of Knowledge transfers," *Journal of Development Economics*, 88(1): 120-131.

Maskus, Keith E. (2000), *Intellectual Property Rights in the Global Economy*, Peterson Institute Press: All Books.

Masten, S. E. (1991), "A Legal Basis for the Firm," In Oliver E. Williamson and Sidney G Winter (eds.), *The Nature of the Firm: Origins, Evolution, and Development*, Oxford and New York: Oxford University Press, pp: 196-212.

Mattoo, A., M. Olarreaga and K. Saggi (2004), "Mode of Foreign Entry, technology transfer, and FDI Policy," *Journal of Development Economics*, 75(1): 95-111.

McKern, B. (1996), "Transnational Corporations and the Exploitation of Natural Resources," In UNCTAD-DTCI, *Transnational Corporations and World Development*, London and Boston: International Thomson Business Press, pp: 327-358.

McNulty, Paul J. (1984), "On the Nature and Theory of Economic Organisation: The Role of the Firm Reconsidered," *History of Political Economy*, 16(2): 233-253.

McPherson, M. A. and J. C. Parker (1993), "A Manual for Conducting Baseline Surveys for Micro - and Small-Scale Enterprises; Tools for Microenterprise Programmes," *GEMINI Technical Notes: Field Research Section*, Maryland, USA: GEMINI.

McPherson, Michael A. (1991), "Micro and Small-Scale Enterprises in Zimbabwe: Results of a Country-Wide Survey," *GEMINI Technical Report 25*, Maryland, USA: GEMINI.

McVicar, Duncan (2002), "Spillovers and Foreign Direct Investment in UK Manufacturing," *Applied Economics Letters*, 1(9): 297-300.

Melvin, James R. (1969), "Increasing Returns to Scale as a Determinant of Trade, "The *Canadian Journal of Economics*, 2(3): 389-402.

Melvin, James R. (1989), "Trade in Producer Services and in Other Specialized Intermediate Inputs," *The American Economic Review*, 79(1): 85-95.

microLINKS (2006), http://www.microlinks.org/ev_en.php?ID=2137_201&ID2=DO_TOPIC assessed on 20th June 2010 at 15.49pm.

Miyamoto, K. (2003), "Human Capital Formation and Foreign Direct Investment in Developing Countries," *OECD Development Centre Working Paper* No. 211.

Molz, Rick, Catalin Ratiu and Ali Taleb (eds.) (2010), *The Multinational Enterprise in Developing Countries: Local versus Global Logic*, London and New York: Routledge.

Morriset, Jacques (2003), "Does a country need a promotion agency to attract foreign direct investment? A small analytical model applied to 58 countries," *Policy Research Working Paper*, World Bank – FIAS, Washington.

Mullings, Beverly (1999), "Insider or Outsider, Both or Neither: some Dilemmas of Interviewing in a Cross-cultural Setting," *Geoforum*, 30(4): 337-350.

Mundell, Robert (1957), "International Trade and Factor Mobility," *The American Economic Review*, 47(3): 321-335.

Nadel, Ernest (1971), "International Trade and Capital Mobility", *The American Economic Review*, Vol. 61, No. 3, Part 1, pp. 368-379.

Nair-Reichert, U. and D. Weinhold (2001), "Causality Tests for Cross-Country Panels: A New Look at FDI and Economic Growth in Developing Counties," *Oxford Bulletin of Economics and Statistics*, 63(2): 153-171.

Narayan, Karin (1993), "How Native is a 'Native' Anthropologist?," *American Anthropologist, New Series*, 95(3): 671-686.

Nast, Heidi (1994), "Women in the Field: Critical Feminist Methodologies and Theoretical Perspectives," *Professional Geographer*, 46(1): 54-66.

Navaretti, Giorgio B. and Anthony J. Venables (2006), *Multinational Firms in the World Economy*, Princeton, NJ: Princeton University Press.

Navaretti, Giorgio B., Isidro Soloaga and Wendy Takacs (2000), "Vintage Technologies and Skill Constraints: Evidence from U.S. Exports of New and Used Machines," *The World Bank Economic Review*, 14(1): 91-109.

Ndikumana, Léonce and Sher Verick (2008), "The Linkages between FDI and Domestic Investment: Unravelling the Developmental Impact of Foreign Investment in Sub-Saharan Africa," *Development Policy Review*, 26(6): 713–726.

Neary, Peter J. (1995), "Factor Mobility and International Trade," *Canadian Journal of Economics*, 28(Special Issue: Essays in International Economics in Honour of Douglas Purvis): S4-S23.

Neary, Peter J. (2002), "Foreign Direct Investment and the Single Market," *Manchester School*, 70: 291-314.

Neary, Peter J. (2008), "Trade Costs and Foreign Direct Investment," In Steven Brakman and Harry Garresten (eds.) *Foreign Direct Investment and the Multinational Enterprise*, Cambridge, Massachusetts: The MIT Press, pp. 13-38.

Nellis, John (2006), "Privatisation – A Summary Assessment," *Centre for Global Development Working Paper* No. 87.

Nelson, Richard R. and Sidney G. Winter (1982), *An Evolutionary Theory of Economic Change*, Cambridge, Massachusetts: The Belknap Press of Harvard University Press.

Newbold, Paul, William L. Carlson and Betty M. Thorne (2010), *Statistics for Business and Economics*, 7th Ed. London: Pearson.

Nigel Pain and Katharine Wakelin (1998), "Export Performance and the Role of Foreign Direct Investment," *NIESR Discussion Papers* No. 131, National Institute of Economic and Social Research.

Noorbakhsh, Farhad, Alberto Paloni and Ali Youssef (2001), "Human Capital and FDI Inflows to Developing Countries: New Empirical Evidence," *World Development*, 29(9): 1593-1610.

Odenthal, Ludger (2001), "FDI in Sub-Saharan Africa," *OECD Development Centre Working Paper*, No. 173.

Olivera, J. H. G (1967), "Is Free Trade a Perfect Substitute for Factor Mobility?," *The Economic Journal*, 77(305): 165-169.

Olofsdotter, Karin (1998), "Foreign Direct Investment, Host Country Capabilities and Economic Growth," *Review of World Economics*, 134(3): 534-547.

Onyeiwu, Steve and Hemanta Shrestha (2004), "Determinants of Foreign Direct Investment in Africa," *Journal of Developing Societies*, 20(1-2): 89-106.

Owusu, J. H. (2001), "Determinants of Export-Oriented Industrial Output in Ghana: The Case of Formal Wood Processing in an Era of Economic Recovery," *Journal of Modern African Studies*, 39(1): 51-80.

Pack, Howard (1993), "Exports and Externalities: The Sources of Taiwanese Growth". *mimeo*.

Pack, Howard (2006), "Econometric versus Case Study Approaches to Technology Transfer," In Hoekman, Bernard and Beata S. Javorcik (eds), *Global Integration and Technology Transfer*, Washington DC: The World Bank, pp: 29-50.

Pack, Howard and Kamal Saggi (2001), "Vertical Technology Transfer via International Outsourcing," *Journal of Development Economics*, 65(2): 389-415.

Pack, Howard and Larry E. Westphal (1986), "Industrial Strategy and Technological Change: Theory versus Reality," *Journal of Development Economics*, 22(1): 87-128.

Pavitt, Keith (1987), "International Patterns of Technological Accumulation," In N. Hood and J. E. Vahlne (eds.), *Strategies in Global Competition*, New York: Wiley, pp: 126-157.

Penrose, Edith T. (1980), *The Theory of the Growth of the Firm*, Oxford, United Kingdom: Basil Blackwell Publishers.

Penrose, Edith T. (1987), "Multinational Corporations," In John Eatwell, Murray Milgate and Peter Newman (eds.), *The New Palgrave: A Dictionary of Economics*, London: Palgrave Macmillan, pp: 562-564.

Perez, T. (1997), "Multinational Enterprises and Technological Spillovers: An Evolutionary Model," *Evolutionary Economics*, 7(2): 169–192.

Petchenkine, Youry (1993), *Ghana: In Search of Stability, 1957-1922*, West Port, Connecticut: Praeger.

Pigato, Maria (2000), "FDI in Africa, Old Tales and New Evidence," Washington D. C.: The World Bank Africa Region, mimeo.

Pigato, Maria (2001), "The Foreign Direct Investment Environment in Africa," *World Bank Africa Region Working Paper Series* No. 15.

Polanyi, Michael (1958), *Personal Knowledge: Towards a Post Critical Philosophy*, London: Routledge.

Pontes, José P. (2004), "A Theory of the Relationship between Foreign Direct and Trade," *Economics Bulletin*, 6(2): 1-8.

Poole, Jennifer (2007), "Multinational Spillovers through Worker Turnover," Department of Economics University of California, Santa Cruz Working Paper.

Portes, Richard and Hélène Rey (2005), "The Determinants of Cross-Border Equity Flows," *Journal of International Economics*, 65(2): 269– 296.

Prasad, E. S., R. G. Rajan and A. Subramanian (2007), "Foreign Capital and Economic Growth," *Brookings Papers on Economic Activity*, 2007:1.

Purvis, Douglas D. Technology, (1972) "Trade and Factor Mobility", *The Economic Journal*, Vol. 82, No. 327, pp. 991 – 999.

Rakowski, James (1969), "Is Labour Mobility a Substitute for Trade?," *The Economic Journal*, 79(313): 174-178.

Ramanathan, K. (2005), *An Overview of Technology Transfer and Technology Transfer Models*, A paper prepared as Head of the UNESCAP Asian and Pacific Centre for Transfer of Technology (APCTT).

Rankin, Neil, Måns Söderbom, and Francis Teal (2005), "Exporting from Manufacturing Firms in Sub-Saharan Africa," *Global Poverty Research Group Working Paper Series*, No. GPRG-WPS-036,.

Rauch, J. E. and A. Casella (2003), "Overcoming Informational Barriers to International Resource Allocation: Prices and Ties," *The Economic Journal*, 113(484): 21-42.

Razin, Assaf (2002), "FDI Flows: A Critical Look," *NBER Reporter*: Spring 2002.

Reuber, G. L., H. Grookel, M. Emerson, and G. Gallais-Hammonno (1973), *Private Foreign Investment in Development*, Oxford: Claredon Press.

Rhee, Yung Whee and Therese Belot (1989), "Export Catalysts in Low-Income Countries," *Industry and Energy Working Paper Series*, No. 5, Washington D.C.: World Bank.

Rhee, Yung Whee and Therese Belot (1990), "Export Catalysts in Low-Income Countries: A Review of Eleven Success Stories," *World Bank Discussion Paper*, No. 72.

Richardson, Martin (1998), "Foreign Entry and Domestic Welfare,*" Review of World Economics*, 134(2): 250-262.

Riddell, Roger C. (1990), "A Forgotten Dimension? A Manufacturing Sector in African Development," *Development Policy Review*, 8(1): 5-27.

Rivera-Batiz, Luis A. and Maria-Angels Oliva (2003), *International Trade: Theory, Strategies and Evidence*, Oxford: Oxford University Press.

Rivera-Batiz, Luis A. and Paul M. Romer (1991), "International Trade with Endogenous Technological Change," *European Economic Review*, 35(4): 971-1004.

Rodriguez-Clare, Andres (1996), "Multinationals, Linkages and Economic Development," *American Economic Review*, 86(4): 852-873.

Rodrik, Dani (1999), "The New Global Economy and Developing Countries: Making Openness Work," *Overseas Development Council Policy Essay* No. 24, (Baltimore, MD).

Rodrik, Dani (2009), "Growth After the Crisis," *Commission on Growth and Development Working paper*, No. 65.

Roe, Alan, Hartmut Schneider with Graham Pyatt (1992), *Adjustment and Equity in Ghana*, Paris: Development Centre of the Organisation for Economic Co-operation and Development, OECD Publications and Information Centre.

Rogoff, K. And C. Reinhart (2003), "FDI to Africa: The Role of Price Stability and Currency Instability," *IMF Working Paper*, No. WP/03/103.

Rothgeb Jr., John M. (1989), *Myths and Realities of Foreign Investment in Poor Countries: The Modern Leviathan in the Third World*, New York: Praeger.

Rugman, Alan M. (1975), "Discussion: Corporate International Diversification and Market Assigned Measures of Risk and Diversification," *Journal of Financial and Quantitative Analysis*, 10(4): 651-652.

Rugman, Alan M. (1979), *International Diversification and the Multinational Enterprise*, Lexington, MA: Lexington Books.

Saggi, Kamal (1996), "Entry into a Foreign Market: Foreign Direct Investment versus Licensing," *Review of International Economics*, 4(1): 99-104.

Saggi, Kamal (2002), "Trade, Foreign Direct Investment and International Technology Transfer: A Survey," *World Bank Research Observer*, 17(2): 191-235.

Sarkar, Jayati (1998), "Technological Diffusion: Alternative Theories and Historical Evidence," *Journal of Economic Surveys*, 12(2): 131-176.

Sarris, Alexander and Hadi Shams (1991). *Ghana under structural adjustment: the impact on agriculture and the rural poor*. New York: Published for the International Fund for Agricultural Development by New York University Press.

Schmitz, Andrew and Peter Helmberger (1970), "Factor Mobility and International Trade: The Case of Complementarity," *The American Economic Review*, 60 (4): 761-767.

Schneider, Friedrich and Bruno S. Frey (1985), "Economic and political determinants of foreign direct investment," *World Development*, 13(2): 161-175.

Schwartz, Herman M. (1994), *States versus Markets: History, Geography, and the Development of the International Political Economy*, New York: St. Martin's Press, Inc.

Sherif, Bahira (2001), "The Ambiguity of Boundaries in the Fieldwork Experience: Establishing Rapport and Negotiating Insider/Outsider Status," *Qualitative Inquiry*, 7(4): 436-447.

Singer, Hans. W. (1950), "The Distribution of Gains between Investing and Borrowing Countries," *The American Economic Review*, 40(2) (Papers and Proceedings of the Sixty-second Annual Meeting of the American Economic Association): 473-485.

Singh, H. and K.W. Jun (1995), "Some New Evidence on Determinants of Foreign Direct Investment in Developing Countries," *Policy Research Working Paper* No.1531.

Singh, Nirvikar and Sugata Marjit (2003), "Introduction," In Nirvikar Singh and Suguata Marjit (eds.), *Joint Ventures, International Investment, and Technology Transfer*. Oxford, U.K.: Oxford University Press, pp: 1-36.

Slaughter, M. J. (2002), "Skills Upgrading in Developing Countries: Has Inward Foreign Diect Investment Played a Role?," *OECD Development Centre Working Paper* No. 192.

Slorach, J. Scott and Jason Ellis Business (2007), *Law: Legal Practice Course Guides*, Oxford: Oxford University Press.

Smeets, Roger (2008), "Collecting the Pieces of the FDI Knowledge Spillovers Puzzle," *The World Bank Research Observer*, 23(2):107-138.

Smith, Susan J (1993), "Bounding the borders: Claiming Space and Making Place in Rural Scotland," *Transactions of the Institute of British Geographers*, 18(3): 291-308.

Smyth, D. J., W. J. Boyes and D. E. Peseau (1975), *Size, Growth, Profits and Executive Compensation in the Large Corporation: A Study of the 500 Largest United Kingdom and United States Industrial Corporations*, London: The Macmillan Press Ltd.

Söderbom, Måns (2001), "What Drives Manufacturing Exports in Africa? Evidence from Ghana, Kenya and Zimbabwe," *CSAE-UNIDO Working Paper* No. 2.

Söderbom, Måns and Francis Teal (2000), "Skills, Investment and Exports from Manufacturing Firms in Africa," *Journal of Development Studies*, 37(2): 13-43.

Söderbom, Måns and Francis Teal (2001a), "Can African Manufacturing Firms Become Successful Exporters?," *CSAE-UNIDO Working Paper* available at http://www.unido.org/fileadmin/import/userfiles/puffk/ldciii07.pdf.

Söderbom, Måns and Francis Teal (2001b), "Firm Size and Human Capital as Determinants of Productivity and Earnings," *CSAE Working Paper Series*, No. WPS/2001-09.

Söderbom, Måns and Francis Teal (2001c), "Are African Manufacturing Firms Really Inefficient? Evidence from Firm-level Panel Data," *CSAE Working Paper Series*, No. WPS/2001-14.

Söderbom, Måns and Francis Teal (2003), "Are Manufacturing Exports the Key to Economic Success in Africa?," *Journal of African Economies*, 12(1): 1-29.

Stephan, Michael and Eric Pfaffmann (1998), "Detecting the Pitfalls of Data on Foreign Direct Investment: A Guide to the Scope and Limits of FDI-Data as an Indicator of Business Activities of Transnational Corporations," *Discussion Paper on International Management and Innovation*, No. 98-02.

Streeten, P. P. (1973), "The Multinational Enterprise and the theory of Development Policy," *World Development*, 1(10): 1-14.

Streeten, P. P. and Lall, S. (1973), *Summary of Methods and Findings of a Study of Private Foreign Manufacturing Investment in Six Less-Developed Countries*, Geneva: UNCTAD.

Sultana, Farhana (2007), "Participatory Ethic: Negotiating Fieldwork Dilemmas in International Research," *ACME: An International E-Journal for Critical Geographies*, 6(3): 374-385.

Svensson, L. E. O. (1984), "Factor Trade and Goods Trade," *Journal of International Economics*, 16(3-4): 365-78.

Sweezy, Paul M. and Harry Magdoff (1972), *The Dynamics of U.S. Capitalism: Corporate Structure, Inflation, Credit, Gold, and the Dollar*, New York: Monthly Review Press.

Tabb, William K. (2004), *Economic Governance in the Age of Globalisation*, New York: Columbia University Press.

Takii, Sadayukii (2005), "Productivity Spillovers and Characteristics of Foreign Multinational Plants in Indonesian Manufacturing 1990-95," *Journal of Development Economics*, 76(2): 521-542.

Tan, Hong and Geeta Batra (1995), "Enterprise Training in Developing Countries: Incidence, Productivity Effects, and Policy Implications," *World Bank Working Paper Series*, No. 15373.

Tan, Hong and Geeta Batra (1996), "Enterprise Training in Developing Countries: Overview of Incidence, Determinants, and Productivity Outcomes," *World Bank Private Sector Development Department Occasional Paper*, No. 9.

Tan, Hong and Gladyz Lopez-Acevedo (2003), "Mexico: In-Firm Training for the Knowledge Economy," *World Bank Policy Research Working Paper*, No. 2957.

Teal, Francis (1998), *Regional Project on Enterprise Development (RPED)/Ghana Manufacturing Sector Survey Waves I – III (1991-93): Background Information on Use of Dataset*, Oxford: Centre for the Study of African Economies (CSAE).

Teal, Francis (1999), "The Ghanaian Manufacturing Sector 1991-1995: Firm Growth, Productivity and Convergence," *Journal of Development Studies*, 36(1): 109-127.

Teal, Francis (2002), *A Note on the Data for Ghanaian Manufacturing Firms: 1991-1997*, Oxford: Centre for the Study of African Economies (CSAE).

Teece, D. J. (1977), "Technology Transfer by Multinational Firms: The Resource Cost of Transferring Technological Know-how," *Economic Journal*, 87(346): 242-261.

Teece, D. J. (1981), "The Market for Know-How and the Efficient International Transfer of Technology," *Annals of the American Academy of Political and Social Science*, 458(1): 81-96.

Thirlwall, A. P. (2006*), Growth and Development: With Special Reference to Developing Economies*, 8th edition, Houndmills, Basingstoke: Palgrave Macmillan.

Thorbecke, Erik and Henry Wan Jr. (2004), "Revisiting East (and South East) Asia's Development Model," Paper prepared for the Cornell Conference on *Seventy Five Years of Development*, Ithaca, NY, May 7-9, 2004.

Todo, Yasuyuki and Koji Miyamoto (2002), "Knowledge Diffusion from Multinational Enterprises: The Role of Domestic and Foreign Learning Activities," *OECD Technical Paper* No. 196, Paris: OECD Development Centre.

Tsikata, Fui S. (1997), "The Vicissitudes of Minerals Policy in Ghana," *Resources Policy*, 23(1-2): pp. 9-14.

Tsikata, G. K., Y. Asante and E. M. Gyasi (2000), *Determinants of Foreign Direct Investment in Ghana*, London: Overseas Development Institute.

Tybout, J.R. (2000), "Manufacturing Firms in Developing Countries: How Well Do They Do and Why?," *Journal of Economic Literature*, 38(1), 11-44.

Udomkerdmongkol, M. and O. Morrissey (2008), "Political Regime, Private Investment and Foreign Direct Investment in Developing Countries," *UNU-WIDER Research Paper*, No. 2008/109.

UNCTAD (1998), *World Investment Report 1998: Trends and Determinants*, Geneva and New York: United Nations.

UNCTAD (1999), *World Investment Report 1999: Foreign Direct Investment and the Challenge of Development*, New York and Geneva: United Nations.

UNCTAD (2000), *World Investment Report 2000: Cross Border Mergers and Acquisitions and Development*, Vienna and New York: United Nations.

UNCTAD (2001), *The Impact of FDI Policies on Industrialisation, Local Entrepreneurship and the Development of Supply Capacity, Policy Issues to Consider*. Geneva: UNCTAD.

UNCTAD (2003a), *Africa's Technology Gap: Case Studies on Kenya, Ghana, Uganda and Tanzania*, New York: United Nations Publications.

UNCTAD (2003b), *World Investment Report 2003: FDI Policies for Development: National and International Perspectives*, New York and Geneva: United Nations.

UNCTAD (2003c*), Investment Policy Review: Ghana*, New York and Geneva: UNCTAD.

UNCTAD (2005), *Economic Development of Africa: Rethinking the Role of Foreign Direct Investment*, New York and Geneva: United Nations.

UNCTAD (2006), *UNCTAD Investment Brief, No. 2: Better Data Needed to Assess FDI Impact*, Geneva: UNCTAD Investment Issues Analysis Branch.

UNCTAD (2009), *World Investment Report: Online Database 2009*, Geneva: UNCTAD.

UNCTAD (2010), *World Investment Report 2010: Investing in a low-carbon economy*, Vienna and New York: United Nations.

UNECA (2006), *Economic Report on Africa 2006 Capital Flows and Development Financing in Africa*, Addis Ababa: United Nations Economic Commission for Africa.

UNIDO (2004), *Industrial Development Report 2004, Industrialisation, Environment and the Millennium Development Goals in Sub-Saharan Africa: The New Frontier in the Fight Against Poverty*, Vienna: UNIDO.

UNIDO (2007), *Africa Foreign Investor Survey 2005: Understanding the Contributions of Different Investor Categories to Development Implications for Targeting Strategies*, Vienna: UNIDO.

UNIDO (2009), *Industrial Development Report 2009, Breaking In and Moving UP: New Industrial Challenges for the Bottom Billion and the Middle-Income Countries*, Vienna: UNIDO.

Van Biesebroeck, Johannes (2005), "Exporting raises productivity in sub-Saharan African manufacturing firms," *Journal of International Economics*, 67(2): 373-391.

Van Hear, N. (1998), *New Diasporas: The Mass Exodus, Dispersal and Regrouping of Migrant Communities*, London: UCL Press.

Van Pottlesberghe de la Porterie, Bruno and Frank Lichtenberg (2001), "Does Foreign Direct Investment Transfer Technology across Borders?," *The Review of Economics and Statistics*, 83(3): 490-497.

Vernon, Raymond (1966), "International Investment and International Trade in the Product Cycle," *Quarterly Journal of Economics*, 80(2): 190–207.

Vernon, Raymond (1971), *The Multinational Spread of US Enterprises*, New York: Basic Books.

Visser, Gustav (2000), "Researcher Positionality and Political-temporal contingency in a Post-Apartheid Research Environment," *Research papers in Environmental and Spatial Analysis*, No. 59. Available at this link (http://www2.lse.ac.uk/geograghyAndEnvironment/research/Researchpapers/rp59.pdf assessed on 14th March, 2010 at 19:54pm).

Waldkirch Andreas and Andra Ofosu (2010), "Foreign Presence, Spillovers, and Productivity: Evidence from Ghana," *World Development*, 38(8): 1114-1126.

Wang, Jian-Ye (1990), "Growth, Technology Transfer, and the Long-run Theory of International Capital Movements," *Journal of International Economics*, 29(3-4): 255-271.

Wang, Jian-Ye and M. Blomström (1992), "Foreign Investment and Technology Transfer: A Simple Model," *European Economic Review*, 36(1): 137-155.

Weisberg, H. F. and B. D. Bowen (1977), *An Introduction to Survey Research and Data Analysis*, San Francisco: W. H. Freeman and Company.

Westphal, Larry E. (2000), "Industrialisation Meets Globalisation: Uncertain Reflections on East Asian Experience," *United Nations University, Institute for New Technologies Discussion Papers*, No. 8.

Wolf, Susanna (2007), "Firm Characteristics of Non-traditional Exporters in Ghana," *European Journal of Development Research*, 19(3): 391-411.

Won, Y., F. S. T. Hsiao and D. Y. Yang (2008), "FDI Inflows, Exports and Economic Growth in First and Second Generation ANIEs: Panel Data Causality Analyses," *KIEP Working Paper* No. 08-02.

Wong, K. – Y. (1986), "Are International Trade and Factor Movements Substitutes?", *Journal of International Economics*, Vol. 21, pp. 25 – 43.

Wong, Kar-Yiu, (1983), "On Choosing among Trade in Goods and International Capital and Labour Mobility: A Theoretical Analysis," *Journal of International Economics*, 14(3-4): 223-250.

Wooldridge, Jeffrey M. (2009), *Introductory Econometrics: A Modern Approach*, 4th Ed., Canada: South-Western.

World Bank (1984), *Ghana: Policies and Programmes for Adjustment*, Washington D. C.: The World Bank.

World Bank (1989), *Sub-Saharan Africa: From Crisis to Sustainable Growth*, Washington DC: The World Bank.

World Bank (1994), *Adjustment in Africa: Reforms, Results, and the Road Ahead*, Oxford: Oxford University Press.

World Bank (2009), *World Development Indicators*, Online statistical database.

World Bank (2010a), *The World Bank Enterprise Survey: Core Questionnaire plus Manufacturing Module*. Washington D.C.: The World Bank, available at www.enterprisesurveys.org (accessed on August 12, 2010 at 10.00am).

World Bank (2010b), *Enterprise Survey and Indicator Surveys: Sampling Methodology*. Washington D.C.: The World Bank, available at www.enterprisesurveys.org (accessed on August 12, 2010 at 9.45am).

World Bank (2010c), *Enterprise Survey Methodology*, Washington D.C.: The World Bank, available at www.enterprisesurveys.org (accessed on August 10, 2010 at 12.40pm).

World Bank and U.N.D.P (1989), *Africa's Adjustment and Growth in the 1980s*, Washington DC: The World Bank.

Xu, Bin (2000), "Multinational Enterprises, Technology Diffusion, and Host Country Productivity Growth," *Journal of Development Economics,* 62(2): 477-493.

Yeaple, Stephen (2003), "The Complex Integration Strategies of Multinational Firms and Cross-Country Dependencies in the Structure of Foreign Direct Investment," *Journal of International Economics,* 60(2): 293-314.

Zafar, Ali (2007), "The Growing Relationship between China and SSA: Macroeconomic, Trade, Investment and Aid Links," *World Bank Research Observer*, 22(1): 103-130.

Zeufack, A. (1999), "Employer-Provided Training under Oligopolistic Labour Markets: Evidence from Thai Manufacturing Firms," World Bank Development Research Group.

Zhang, K. H. (2006), *How Does FDI Affect a Host Country's Export Performance? The Case of China*, mimeo, Department of Economics, Illinois State University.

Zhang, K. H. and S. Song (2001), "Promoting Exports: The Role of FDI in China," *China Economic Review*, 11(4): 385-396.

Appendices

Complementing Information to Chapters 4 – 7

A.1: Appendix to Chapter 4

Appendix Table A.1: Global Definitions of Small and Medium Sized Enterprises

Country	Classification	Headcount
Albania	Micro	less than 10
	Small	from 10 - 40
	Medium	from 50 - 250
Bulgaria	Small	less than 50
Hungry	Small	from 11 - 50
	Medium	from 51 - 250
Poland (unofficial)	Small	less than 50
	Medium	from 51 - 250
Romania	Small	from 1 - 20
	Medium	from 21 - 200
Slovakia	Small	from 1 - 24
	Medium	from 25 - 500
Slovenia	Small (industry, mining, construction)	from 1 - 50
FYR Macedonia		less than 50
Estonia	Small	less than 80
Latvia	Small	less than 25
Azerbaijan	Small (industry	less than 50
	Small (transport)	less than 15
	Small (construction)	less than 25
	Small (retail and servicing)	less than 10
	Medium (industry)	from 51 - 250
	Medium (transport)	from 16 - 75
	Medium (construction)	from 26 - 150
	Medium (retail and servicing)	from 11 - 50

Appendix Table A.1 (contd.)

Country	Classification	Headcount
Belarus	Small (industry)	less than 200
	Small (innovation)	less than 100
	Small (construction/production)	less than 50
	Small (catering/services)	less than 50
	Small (retail and servicing)	less than 25
	Small (other non-production)	less than 25
Kazakstan	Small (industry and construction)	less than 200
	Small (science)	less than 100
	Small (transport, servicing, production)	less than 50
	Small (catering, retail trade, education)	less than 25
	Medium (industry and construction)	less than 5000
	Medium (science)	less than 500
	Medium (transport, servicing, production)	less than 1000
	Medium (catering, retail trade, education)	less than 500
Moldova	Micro	less than 20
	Small	from 20 - 75
Russian Federation	Small (industry and construction)	less than 100
	Small (agriculture)	less than 60
	Small (science)	less than 60
	Small (wholesale trade)	less than 50
	Small (retail and servicing)	less than 30
	Small (other production and non-production)	less than 50
Tajikistan	Small (industry and construction)	less than 50
	Small (other)	less than 15
Ukraine	Small (industry and construction)	less than 200
	Small (other production)	less than 50
	Small (science)	less than100
	Small (other non-production)	less than 25
	Small (retail trade)	less than 300
Uzbekistan	Small	less than 300
	Medium	300 - 1000
Source: http://www.unece.org/indust/sme/def-cit.htm		
UK	Micro	less than 10
	Small	less than 50
	Medium	50 - 249
	Large	more than 250
Source: www.sbs.gov.uk/default.php?page=statistics/smedefs.php		
China	Small	50 - 100
	SME	less than 500

Appendix Table A.1 (contd.)

Country	Classification	Headcount
Pakistan	Cottage	less than 10
	Small	more than 10
	Medium	more than 10
Malaysia	SME	less than 75
	Small (manufacturing)	5 - 50
	Medium (manufacturing)	50 - 75
Source: www.tradenetsl.lk/sme/definition.htm		
Cost Rica	Small	0 - 20
	Medium	20 - 99
Nicaragua	Small	1 - 10
	Medium	11 - 100
Source: www.iadb.org/smeobservatory		
World Bank Group	Micro	up to 10
	Small	up to 50
	Medium	up to 300
Source: http://www2.ifc.org/sme/html/sme_definitions.html		
European Union	Micro	up to 10
	Small	up to 50
	Medium	up to 250
Source: http://europa.eu.int/comm/enterprise/enterprise_policy/sme_definitions/index_en.htm		

Sourced from (Goldin 2005)

A.2: Appendix to Chapter 4

Appendix A. 2: Survey Questionnaire for FDI Firms in Ghana

Section A: General Profile of Establishment	
1. Name of Establishment	
2. Year Established	
3. Year Operations Started	
4. What are your main Products	a) b) c) d)
5. Address and Location	
6. Telephone	
7. Email	
8. Website of Firm	
9. Name of Respondent	
10. Position in the Establishment	

Section B: Impact of General Economic Conditions on Firms

Using the following scale below please rate how each of the issues raised in Questions 11 and 12 affects your firm's operations in Ghana:

1 – Strongly Disagree **2 – Disagree** **3 – Neutral** **4 – Agree** **5 – Strongly Agree**

11. The major constraints to your export performance:

Lack of Knowledge of Export Markets		Exchange Rate Instability	
Lack of Knowledge of Export Procedures		Poor Internet Connectivity	
Delays with Procedures for Exporting		Transport Difficulties	
Delays at the Ports		Poor Electricity Supply	
Lack of Support by State Agencies		Other, please specify ……..	

12. The major constraints to your overall operational performance:

Delays from Suppliers of Local Inputs		Delays Experienced at the Ports	
Delays with Government Bureaucracy		High Cost of Production Inputs	
Lack of Skilled Labour		High Cost of Borrowing from Banks	
Unstable Electric Power Supply		High Transport Costs	
Non-availability of Raw Materials		Other, please specify ……..	

13. In respect of the following aspects of the Ghanaian economy, which do you consider beneficial/detrimental to your business operations?

	Beneficial	**Detrimental**	**Don't Know**
Sustained Growth of the Economy, in terms of GDP growth			
Expanding Domestic Market			
Liberalised Trade Regime, such as absence of import and export restrictions			
Consistency in Government Economic Policies			
Growing Labour Force			
Other, please specify ……			

14. Please provide any suggestions/comments regarding the Ghanaian economic environment on your firm's operations:

……

……

…….....

……..

Section C: Assessing Impact of FDI within Firm

This section is intended to assess the impact of Foreign Direct Investment on the operations and performance of FDI, for both firms that were established directly as a result of Foreign Direct Investment and those that have received it after their establishment.

15. Was your firm established as a result of Foreign Direct Investment? Yes / No

16. If Yes, please proceed to Q. 17, if No, Did you receive Foreign Direct Investment after the establishment of the firm? Yes / No

17. Did the firm/introduction of FDI lead to the following activities? ... … **Please tick the appropriate box**

Activity	Yes	No	Don't Know
A. Introduced a new product(s)?			
B. ……If Yes, is this new product(s) exported?			
C. Improved an existing product?			
D. ……If Yes, is this improved product exported?			
E. Developed a new product?			
F. ……If Yes, is this new product exported?			
G. Changed (Improved) an existing production process?			
H. Introduced a new production technology in the operations of the firm?			
I. Introduced new marketing techniques?			
J. Developed a new market(s) overseas?			
K. Developed a new market in Ghana?			
L. Undertake any Research and Development expenditure between 2008 and 2009?			
M. Introduced an in-house training programme for Ghanaian staff?			
N. Provide Formal Training for Ghanaian staff on Marketing Techniques in Foreign Market(s)?			
O. Provide Formal Training for Ghanaian staff on Operational or Production Management?			
P. Provide Formal Training for Ghanaian staff on Organisational Management?			
Q. Provide Formal Training for Ghanaian staff outside the firm, but in Ghana?			
R. Provide any mentoring of Ghanaian staff by foreign staff in the firm?			
S. Provide any form of Informal Training for Ghanaian staff?			

18. Which categories of staff receive training? **Please tick the appropriate boxes**

Administrative Managers	
Marketing Managers	
Supervisors	
Workers on the Factory Floor	
Others, please specify ……	

19. Please rate the impact of FDI activity on the following indicators of firm performance

Impact	No Change	Decrease	Increase	Don't know
A. Production costs				
B. Production time				
C. Output				
D. Employment				
E. Profits				
F. Exports to foreign markets				
G. Domestic market share				
H. Other, please specify ……...				

Section D: Employment Profile

20. Employment

	2007	**2008**
A. Total Number of persons employed		
B. How many are Full Time employees		
C. How many are Part Time employees		

21. Of the total number employed:

	Ghanaians		**Foreigners**	
	2007	2008	2007	2008
Ai. How many are University Graduates				
Aii. How many are Science and Mathematics Graduates				
Bi. How many are polytechnic Graduates				
Bii. How many are Science and Mathematics Graduates				

Section E: Profile on Firms' Operations

22. What was the value of total sales for 2008? **Please tick the appropriate box**

$0 - $150,000		$500,000 - $750,000	
$150,000 - $300,000		$750,000 - $1,500,000	
$300,000 - $500,000		Over $1,500,000	

23. What was the value of total sales in the previous 3 years? **Please tick appropriately**

	2007	**2006**	**2005**
$0 - $150,000			
$150,000 - $300,000			
$300,000 - $500,000			
$500,000 - $750,000			
$750,000 - $1,500,000			
Over $1,500,000			

24. Was the firm exporting before it received FDI? Yes / No

25. What was the percentage of total sales exported in 2008? ……. (%)

26. What was the percentage of total sales exported over the previous 3 years?

	(%) Exported
2007	
2006	
2005	

27. What are the major markets/destinations you export to, and what percentage of total exports goes to these markets/destinations? **Please tick appropriately and indicate percentage shares**

	Tick	**(%)**		**Tick**	**(%)**
United States of America			Japan		
Canada			China		
Britain			India		
Germany			Nigeria		
The Netherlands			South Africa		
France			Other, please specify ……..		

28. Have you received any help in respect of exporting activities from any of these Agencies or Associations?

	Yes	**No**	**Don't Know**
A. Ghana Export Promotion Centre			
B. Ghana Investment Promotion Centre			
C. Association of Ghana Industries			
D. Private Enterprise Foundation			
E. Federation of Association of Ghanaian Exporters			
F. Other, please specify ……			

Section F: Management Profile of Firms

29. How will you describe the ownership of your establishment? **Please tick the appropriate box**

Wholly owned foreign establishment	
Joint venture	
Other, please specify ……..	

30. Ownership Structure of Firm

Foreign Equity (%)	
Local Equity (%)	
Other, Please Specify (%) ……	

31. Management Structure of Firm

Ghanaian (%)	
Foreign (%)	
Other, Please Specify (%) …….	

32. Mode of Acquisition of by Foreign Equity **Please tick the appropriate box**

Borrowing Abroad	
Borrowing Domestically	
Savings made Abroad	
Savings made Domestically	
Other, please specify ……..	

33. Country of Origin of Foreign Investor(s) **Please indicate below**

A.	C.
B.	D.

34. Mode of Entry into the Country **Please tick the appropriate box**

New Investment (Greenfield Investment)	
Full/Part Acquisition of Existing Private Firm	
Full/Part Acquisition of Existing Public Firm via Privatisation	
Partnership with Ghanaian Entrepreneur(s)	
Other, please specify ……	

A.3: Appendix to Chapter 4

Appendix Figure A.1: Map of Ghana Showing Administrative Regions and Capital Cities

Sourced from: www.About.com (http://geography.about.com/od/ghanamaps/Ghana_Maps_.htm) on 20th July 2009

A.4: Appendix to Chapter 5

Appendix A.4: Blue Skies Ghana Limited - the case study of an Export-Oriented British Foreign Direct Investment Firm with (Backward) Linkages with Suppliers

Background
Blue Skies Ghana Limited is a subsidiary of Blue Skies Holdings Limited, which is registered in the United Kingdom, started business in Ghana in 1998 and is located at Nsawam in the Eastern region of Ghana. The Ghanaian operation was the first of the Holdings network of production sites and remains the biggest.

Its primary activity is the export of fresh-cut fruits to Europe. These fruits include Pineapple, Pawpaw, Mango, Peach, and Coconut. In addition, they produce a combination of natural fruit juices from pineapple, mango, and peach. These products are supplied to major retail outlets, such as Sainsbury's, ASDA and Waitrose in the UK, ALDI and Albert Hein in Germany and Holland as well as other major retail outlets in France and Switzerland.

Despite being a FDI firm, its entire workforce is Ghanaian (approximately 1200 employees); the majority of the workers are female (about 52 percent), even at the top level of management.

Investments in Modern Production Technologies
Despite the relatively large number of persons employed by the firm the production process involves the use of relatively advanced technological equipment. Approximately 50 percent of the production process is automated, with very little supervision. It has also invested in state-of-the-art quality assurance systems, a state-of-the-art refrigeration system, a tracking mechanism for its exports, and an eco-friendly recycling plant, which produces compost for farmers and a small amount of electricity to power some of its systems.

These investments, especially in quality assurance, are the result of its relations with overseas markets, which require high standards in terms of quality of products, the level of technological sophistication, and on-time delivery of the products. Hence it is unsurprising that these investments have been made by the firm. According to the Operations Manager technological upgrading has become an essential part of the production process in order to maintain market shares and the trust and confidence of their clients.

Linkages with Suppliers via Training
The firm promotes and maintains a very healthy and positive relationship with its suppliers, the farmers. Despite its reliance on supplies of fruits from farmers, the firm does not own any farms. However, the farmers are integrated into the production framework of the firm, and thus treated as though they were employees.
It only runs a demonstration farm, which serves as a training unit for supplier farmers. Farmers are therefore updated on the latest techniques in land management on the farm, the best use of farming equipment and general farm management practices. They are also provided with training on modern farming practices, crop care, water management on farms, and how to meet the fruit specification standards required by the firm.

The training is provided on a regular basis and is designed as an interactive process. During these sessions farmers are expected to provide feedback on their experiences and challenges, as well as suggestions on how to improve their productivity. According to the firm, the benefits of this training to farmers have been the dramatic improvement in productivity of farms and in the quality of fruits that the farmers supply to the firm. This has also resulted in a reduction in the volume of inputs (fruits) that are rejected (because of the specification requirements by the firm), and thus an increase in the profitability of the firm's operations.

A.5: Appendix to Chapter 5

Appendix A.5: Promasidor Ghana Limited – the case study of a Market-seeking Anglo-African Foreign Direct Investment Firm engaged in Product and Market Innovation

Background
Promasidor Ghana Limited, which is a subsidiary of the Promasidor Group, was established in 1998 and began operations in 1999. The company specialises in the production of dairy products, beverages, and food enhancements, and in the last few years it has began producing non-dairy creamers.

Innovative Activities – Product and Domestic Market Development
The market in Ghana for dairy products, beverages, and food enhancements has for several decades been dominated by Unilever Ghana Limited and Nestle Ghana Limited. Thus, from its establishment in 1998 it was confronted by a huge challenge to develop a new domestic market niche and to compete effectively in a domestic market dominated by two international giants in the industry.

To overcome this challenge, the firm embarked on a mission to 'Africanise' its products. According to the Head of Marketing, Nestle and Unilever did not attempt to indigenise their products; product development by Nestle and Unilever was undertaken in Europe largely for a European market and standardised for production across the world.

Product Development
At Promasidor Ghana, they recognised that to improve their share of market for dairy products, they had to "indigenise" the products. Moreover, they set themselves an objective of encouraging the dairy intake of Ghanaians.[67] Thus, the strategy of developing and introducing new dairy and beverage products represents an attempt to introduce milk to the larger population via the "back door".

Regarding product development, Promasidor Ghana hinted that it carries out extensive research, using local researchers to develop a wide product range. In this regard, the firm claims to have pioneered the first 'field milk' for the African environment. 'Field milk' it is claimed has a low fat content because it is produced using a vegetable oil base, which ensures it has a longer shelf life compared to the products of their competitors. Field milk has a shelf life of 24 months compared to the 12 months of fat based milk.

The Head of Marketing at Promasidor Ghana noted that an important factor behind the success (in developing products suitable for the local market needs) is the independence they have in experimenting with new ideas and products. According to the Head of Marketing, their counterpart managers in their competitor firms, which are all multinationals, do not have the freedom to develop products for the local market. It

[67] The Food and Agriculture Organisation reports that milk consumption per person per year in Ghana from 2001 to 2007 averaged approximately 8kg per capita per year, well below the world average of 108kg per capita per year per person.

was claimed that in these multinational firms, new products are developed in Europe, with no consideration for the local, cultural and environmental factors and subsequently imposed on the local managers in Accra. The marketing techniques of these new products are developed overseas, hence lacking any domestic input. Consequently, it is claimed some of these products have not penetrated the domestic market as expected, and in a few cases have failed to make any impression on consumers.

Promasidor Ghana has introduced innovation in the packaging of its products. Products were packaged in various sizes to ensure that its products had a wider consumer reach. A key component in the innovation of product packaging was in terms of size. With a wide range of sizes, every consumer, from the very poor who can hardly afford existing dairy products were now able to buy these very small-sized dairy and beverage products for instant and one-time use.

In recent years, it has also focused attention on the development of non-dairy products. This is intended to overcome the low intake of dairy products, especially milk in a population, which traditionally has a high level of lactose-intolerance.

Market Development

Market development and product research relies on in-house research and development activities. These activities are anchored in the need to achieve the core business activities of the firm, strengthen its competences through continuous innovation and product development, and a yearly evaluation of the outcome of this research in terms of product sales and feedback from suppliers and customers. After the introduction of a new product, it goes through the following process: use of local market information to assess the niche market for the new product, product testing, and the use of local market suppliers to gather customer feedback.

The development of new products relies extensively on cultural and environmental factors, especially in a culture where milk consumption on a regular basis is associated with wealth and higher social status. A quote is worthy at this point on product development: "the process starts as a micro and small scale project, goes through testing to ensure it satisfies cultural and market appeal and acceptance, and can be marketed in a way that cuts across various social and ethnic groups."

According to the Marketing Manager, what distinguishes their products from that of their competitors is that their products are developed with a heavy reliance on local cultural and environmental information based on previous research undertaken in universities and other research institutions in Ghana. For example, because they took into consideration the tropical weather conditions with high temperatures, their powdered milk products have a longer shelf life than any of their competitors. Indeed, this important characteristic of their product has enabled them to increase their market share significantly in the relatively short time period they have been in operation. Consequently, output of dairy products doubled between 2007 and 2008, and was expected to rise further in 2009. The installed production capacity has therefore been increased by 60 percent, with plans to increase this further in the future.

Since 2007 the firm has began widening its focus to the West Africa sub-region. It has therefore begun to collaborate with Promasidor Nigeria to develop products and use similar marketing techniques to expand its market to other West African countries. Promasidor does not directly export, however its products are now on sale in Burkina Faso, Cote d'Ivoire, Liberia, Sierra Leone and Senegal. These products are sold to

wholesale suppliers from these countries that purchase directly from Promasidor Ghana, in Accra. Currently, the firm serves as a distribution hub for these West African countries.

Training and the Development of Local Management Capacity

The firm actively encourages the training and development of Ghanaian workers through several schemes available in the firm. It recruits young and enterprising graduates fresh out of university and provides in-house training on the basics of the firm, its operations, becoming acquainted with the work environment and the work ethic expected. Subsequently, these recruits are assigned to specific tasks, termed 'expert desks'. These expert desks represent the workshop for future research into product development and marketing research. One important aspect of this process is the freedom given to these graduates to think and develop ideas which might help the expansion of the business of the firm.

The scheme by the firm to recruit and train is not limited to young university graduates. The firm has a unique programme to encourage and develop the skills of senior managers. The proportion of senior managers who are Ghanaians is approximately 90 percent. Ghanaian senior managers have been given an opportunity to show their talent within the firm. According to the Head of Human Resources, the presence of these opportunities within the firm has not come without frictions with foreign senior managers. It is claimed the foreign senior managers did not initially have confidence in their Ghanaian counterparts, and this led to the sidelining of Ghanaian senior managers in major decision making. But it turned out on many occasions that these decisions made through this process only resulted in failed ventures and programmes. In the face of these failures, the alternative was to resort to local knowledge.

It is claimed that the change to the reliance on Ghanaian expertise in decision making at the firm appears to have turned things around. According to the Marketing Manager, Ghanaian managers have proved their worth to the firm based on the outcome of their actions. The claim is that, based on the competences of the Ghanaian senior managers, they are now permitted to pursue, freely and independently, business projects and manage them, with very little interference from their foreign colleagues. It was reported that proportion of Ghanaian senior managers had increased gradually since the firm was established in 1998. The current figure of 90 percent is a manifestation of the quality of work by Ghanaian senior managers and a reflection of the current organisational philosophy of the firm to allow them to experiment, develop and promote products, programmes and other projects, which are in the interest of the firm. Currently, almost every aspect of the firm's operations is under the supervision of Ghanaian senior managers.

A.6: Appendix to Chapter 5

Appendix Table A.6a: Employment Shares of Ghanaian and Foreign University and Polytechnic Graduates, 2007

	Share of Ghanaian Graduates in Total Employment 2007	Share of Ghanaian Science&Maths Graduates in Total Employment 2007	Share of Ghanaian Polytechnic Graduates in Total Employment 2007	Share of Ghanaian Polytechnic Science&Maths Graduates in Total Employment 2007	Share of Ghanaian Graduates in Average Total Employment 2007	Share of Ghanaian Polytechnic Graduates in Average Total Employment 2007	Share of Ghanaian Science&Maths Graduates in Average Total Employment 2007	Share of Ghanaian Polytechnic Science&Maths Graduates in Average Total Employment 2007
N	69	69	69	69	69	69	69	69
Missing	0	0	0	0	0	0	0	0
Mean	.127294	.068313	.141893	.077284	.129600	.143648	.068928	.078039
Median	.050000	.000000	.066667	.000000	.050000	.066667	.000000	.000000
Mode	.0500	.0000	.0000	.0000	.0333[a]	.0000	.0000	.0000
Std. Deviation	.4498464	.4444070	.4437676	.4437440	.4522508	.4441596	.4444496	.4438240
Variance	.202	.197	.197	.197	.205	.197	.198	.197
Range	3.7000	3.7000	3.7000	3.7000	3.7000	3.7000	3.7000	3.7000
Minimum	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
Maximum	3.7000	3.7000	3.7000	3.7000	3.7000	3.7000	3.7000	3.7000

Source: Author's Computation from own survey data

Appendix Table A.6b: Employment Shares of Ghanaian and Foreign University and Polytechnic Graduates, 2007

	Share of Foreign Polytechnic Graduates in Total Employment 2007	Share of Foreign Polytechnic Graduates in Average Total Employment 2007	Share of Foreign Polytechnic Science&Maths Graduates in Average Total Employment 2007	Share of Foreign Polytechnic Science&Maths Graduates in Total Employment 2007	Share of Foreign Graduates in Total Employment 2007	Share of Foreign Graduates in Average Total Employment 2007	Share of Foreign Science&Maths Graduates in Average Total Employment 2007	Share of Foreign Science&Maths Graduates in Total Employment 2007
N	69	69	69	69	69	69	69	69
Missing	0	0	0	0	0	0	0	0
Mean	.059420	.059420	.053623	.053623	.076018	.076097	.055528	.055502
Median	.000000	.000000	.000000	.000000	.016667	.016667	.000000	.000000
Mode	.0000	.0000	.0000	.0000	.0125[a]	.0125[a]	.0000	.0000
Std. Deviation	.4471764	.4471764	.4454277	.4454277	.4431057	.4430938	.4452299	.4452327
Variance	.200	.200	.198	.198	.196	.196	.198	.198
Range	3.7000	3.7000	3.7000	3.7000	3.7000	3.7000	3.7000	3.7000
Minimum	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
Maximum	3.7000	3.7000	3.7000	3.7000	3.7000	3.7000	3.7000	3.7000

Source: Author's Computation from own survey data

Appendix Table A.6c: Employment Shares of Ghanaian and Foreign University and Polytechnic Graduates, 2008

	Share of Ghanaian Graduates in Total Employment 2008	Share of Ghanaian Science&Maths Graduates in Total Employment 2008	Share of Ghanaian Polytechnic Graduates in Total Employment 2008	Share of Ghanaian Polytechnic Science&Maths Graduates in Total Employment 2008	Share of Ghanaian Graduates in Average Total Employment 2008	Share of Ghanaian Science&Maths Graduates in Average Total Employment 2008	Share of Ghanaian Polytechnic Graduates in Average Total Employment 2008	Share of Ghanaian Polytechnic Science&Maths Graduates in Average Total Employment 2008
N	69	69	69	69	69	69	69	69
Missing	0	0	0	0	0	0	0	0
Mean	.104011	.055239	.119418	.054709	.106542	.057036	.121336	.055522
Median	.045714	.000000	.068750	.000000	.045714	.000000	.071429	.000000
Mode	.0500	.0000	.0000	.0000	.0333[a]	.0000	.0000	.0000
Std. Deviation	.2580159	.2565827	.2494782	.2423558	.2624636	.2599418	.2501836	.2425268
Variance	.067	.066	.062	.059	.069	.068	.063	.059
Range	2.0182	2.0182	2.0182	2.0182	2.0182	2.0182	2.0182	2.0182
Minimum	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
Maximum	2.0182	2.0182	2.0182	2.0182	2.0182	2.0182	2.0182	2.0182

Source: Author's Computation from own survey data

Appendix Table A.6d: Employment Shares of Ghanaian and Foreign University and Polytechnic Graduates, 2008

	Share of Foreign Graduates in Total Employment 2008	Share of Foreign Science&Maths Graduates in Total Employment 2008	Share of Foreign Science&Maths Graduates in Average Total Employment 2008	Share of Foreign Graduates in Average Total Employment 2008	Share of Foreign Polytechnic Graduates in Average Total Employment 2008	Share of Foreign Polytechnic Science&Maths Graduates in Average Total Employment 2008	Share of Foreign Polytechnic Science&Maths Graduates in Total Employment 2008	Share of Foreign Polytechnic Graduates in Total Employment 2008
N	69	69	69	69	69	69	69	69
Missing	0	0	0	0	0	0	0	0
Mean	.052673	.031243	.031269	.052844	.038106	.029249	.029249	.038106
Median	.020000	.000000	.000000	.020000	.000000	.000000	.000000	.000000
Mode	.0125[a]	.0000	.0000	.0250[a]	.0000	.0000	.0000	.0000
Std. Deviation	.2408703	.2427800	.2427772	.2408456	.2524291	.2429605	.2429605	.2524291
Variance	.058	.059	.059	.058	.064	.059	.059	.064
Range	2.0182	2.0182	2.0182	2.0182	2.0182	2.0182	2.0182	2.0182
Minimum	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
Maximum	2.0182	2.0182	2.0182	2.0182	2.0182	2.0182	2.0182	2.0182

Source: Author's Computation from own survey data

A.7: Appendix to Chapter 6

Appendix Table A.7: Number of Firms Receiving Training, Domestic and Foreign

		Non-FDI	FDI (Foreign)	All Firms
Government Agency				
Before 1996	Yes	10	0	10
	No	154	14	168
1996	Yes	9	0	9
	No	154	14	168
1997	Yes	8	0	8
	No	154	14	168
Business Advisors				
Before 1996	Yes	6	0	6
	No	158	14	168
1996	Yes	6	0	6
	No	157	14	171
1997	Yes	7	0	7
	No	156	14	170
Other Local Firms				
Before 1996	Yes	2	1	3
	No	162	13	175
1996	Yes	2	1	3
	No	161	13	174
1997	Yes	3	1	4
	No	160	13	173
International NGOs				
Before 1996	Yes	11	0	11
	No	153	14	167
1996	Yes	6	0	6
	No	158	14	172
1997	Yes	7	0	7
	No	157	14	171

Source: Authors Computations from Wave 5 of RPED/GMES
Note: Number firms are based on valid responses.

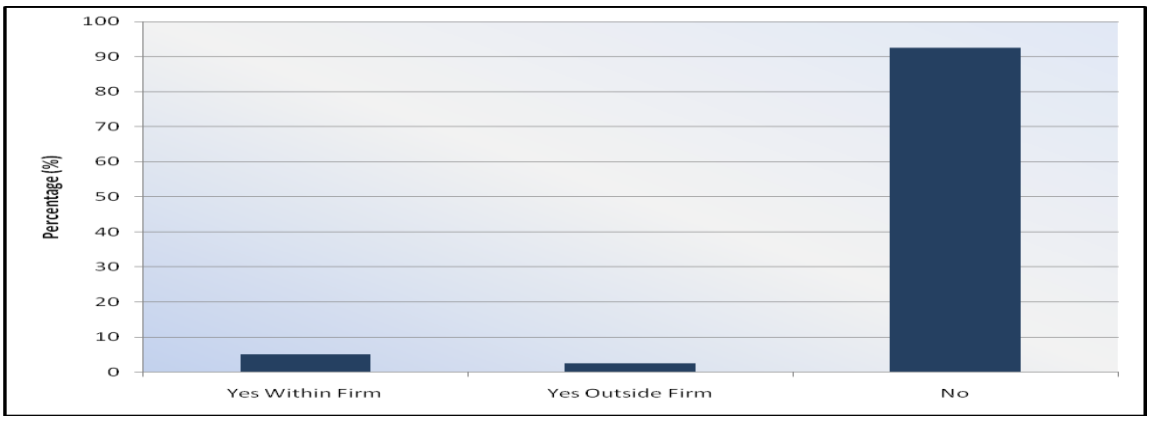
Appendix Table A.7 (Contd): Number of Firms Receiving Training (RPED/GMES Wave 5)

		Non-FDI	FDI (Foreign)	All Firms
Other Local NGOs				
Before 1996	Yes	5	0	5
	No	159	14	173
1996	Yes	1	0	1
	No	162	14	176
1997	Yes	8	0	8
	No	155	14	169
Foreign Firms				
Before 1996	Yes	4	0	4
	No	160	14	174
1996	Yes	5	0	5
	No	158	14	172
1997	Yes	5	0	5
	No	158	14	172

Source: Authors Computations from Wave 5 of RPED/GMES

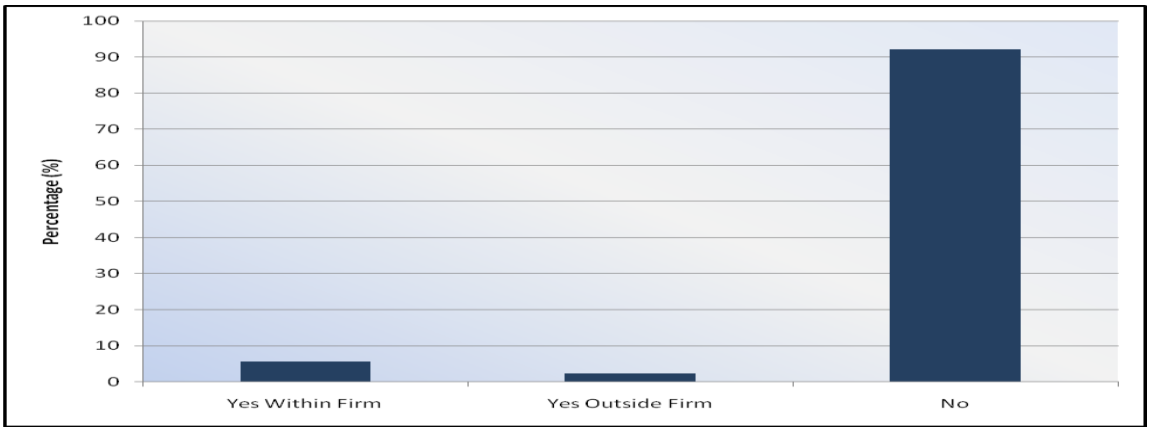
Note: There was no report of firms receiving training from Church Groups and the Military. The data also reveals that the duration of training provided by government agencies ranged from 1 to 25 months. The duration for that provided by business advisors ranged from 1 to 8 months. That by other local firms ranged from 1 to 5 months. That by international NGOs and local NGOs ranged from 1 to 8 months. That by foreign firms ranged between 1 and 2 months. There is nonetheless no information from the survey whether the training received or provided was structured under a formal training scheme.

Appendix Figure A.2: Number of Workers in 'Current on-the-job Training' All firms



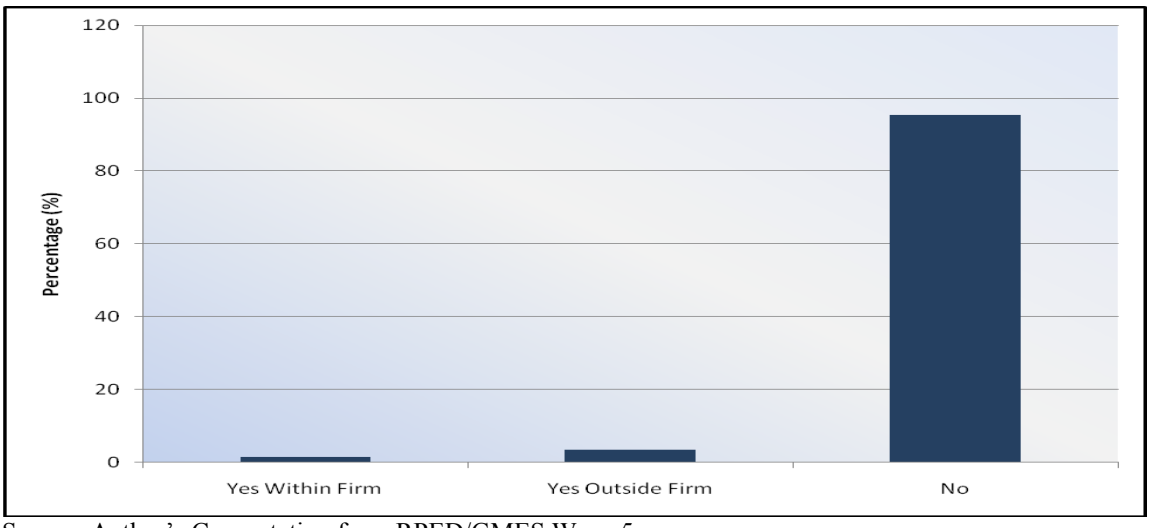
Source: Author's Computation from RPED/GMES Wave 5

Appendix Figure A.3: Number of Workers in 'Current on-the-job Training' Domestic Firms



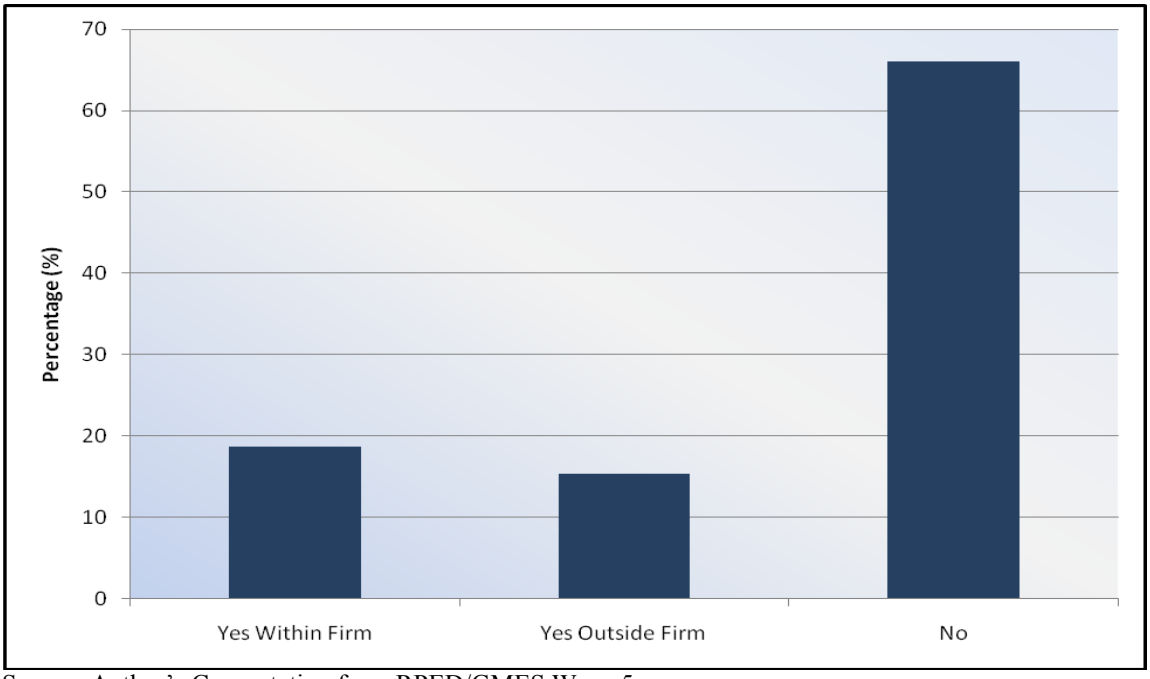
Source: Author's Computation from RPED/GMES Wave 5

Appendix Figure A.4: Number of Workers in 'Current on-the-job Training' Foreign Firms



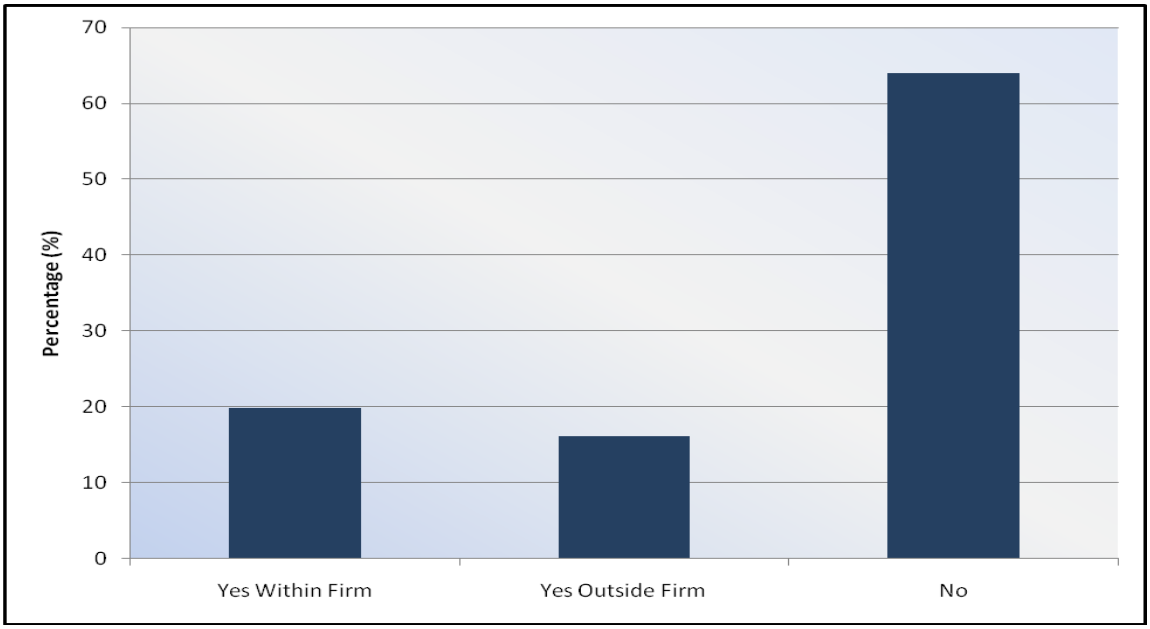
Source: Author's Computation from RPED/GMES Wave 5

Appendix Figure A.5: Number of Workers with 'Previous on-the-job Training' Domestic Firms



Source: Author's Computation from RPED/GMES Wave 5

Appendix Figure A.6: Number of Workers with 'Previous on-the-job Training' Foreign Firms



Source: Author's Computation from RPED/GMES Wave 5

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Appendix A.8: Formula for Testing Equality of Two Proportions (Large Samples)

The test procedure for comparing two population proportions is developed based on a standard model with a random sample of n_x observations from a population of with a proportion P_x of 'successes' and second independent random sample n_y observations from a population with a proportion P_y of 'successes'.
To test the hypothesis that the population proportions P_x and P_y are equal, their common value is denoted by P_0. Then under this hypothesis

$$Z = \frac{(\hat{P}_x - \hat{P}_y)}{\sqrt{\frac{P_0(1-P_0)}{n_x} + \frac{P_0(1-P_0)}{n_y}}}$$

Where $\hat{P}_x$ is the sample estimate of the population proportion for P_x, $\hat{P}_y$ is the sample estimate for the population proportion P_y, P_0 is the pooled estimate of the population proportion, n_x and n_y are the sample sizes for the observations X and Y respectively.

The pooled estimate can be defined as follows, $\hat{P}_0 = \frac{n_x \hat{P}_x + n_y \hat{P}_y}{n_x + n_y}$ and it estimates the common value for P_x and P_y. For large sample sizes – $nP_0(1 - P_0) > 5$ – the following test has significance level α:
In our case we restrict ourselves to the following hypothesis

$H_0 : P_x - P_y = 0 \;\; or \;\; P_x - P_y \geq 0$

$H_1 : P_x - P_y < 0$

The decision rule is as follows:

Reject H_0 *if* $\frac{(\hat{P}_x - \hat{P}_y)}{\sqrt{\frac{\hat{P}_0(1-\hat{P}_0)}{n_x} + \frac{\hat{P}_0(1-\hat{P}_0)}{n_y}}} < -Z_\alpha$, where Z_α is the critical value under the standard normal distribution. Given that this is a one-tail test the critical value at α = 0.05, that is, $-Z_{0.05} = -1.645$.

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Appendix A.9: Statistical Test for Equal Variances (Age of Firms)

The test for the equal variances follows the approach described in Newbold, Carlson and Thorne (2010: 432-434). To test the assumption that population variances from independent samples are equal we use the following F test. We define s_x^2 to be sample variance for a random sample of n_x observations from a normally distributed population with population variance σ_x^2. A second independent random sample of size n_y provides a sample variance of s_y^2 from a normal population with population variance σ_y^2. Then the random variable

$F = \frac{s_x^2/\sigma_x^2}{s_y^2/\sigma_y^2}$ follows a distribution known as the F distribution, with numerator degrees of freedom $(n_x - 1)$ and denominator degrees of freedom $(n_y - 1)$. An F distribution with numerator degrees of freedom v_1 and denominator degrees of freedom v_2 will be denoted $F_{v1,v2}$. We denote as $F_{v1,v2,\alpha}$ the number for which $P(F_{v1,v2} > F_{v1,v2,\alpha}) = \alpha$, where α is the level of significance.

For practical applications the F ratio is written as $F = \frac{s_x^2}{s_y^2}$ with the larger sample variance in the numerator and the smaller sample variance in the denominator.

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Appendix Table A.8: F-test: Two Samples (FDI and All manufacturing) Age

	FDI (Own	All Manufacturing (WB Enterprises
Variance	155.980	144.633
N	69	312
Hypothesised mean	0	
DF numerator	68	
DF denominator	311	
F statistic	1.0785*	
F critical, 0.01 (one tail)	1.51	

*Hypothesis accepted at 99 percent confidence level

Appendix Table A.9: F-test: Two Samples (FDI and Domestic) Age

	FDI (Own	Domestic firms (WB Enterprises
Variance	155.980	131.135
N	69	291
Hypothesised mean	0	
DF numerator	68	
DF denominator	290	
F statistic	1.189*	
F critical, 0.01 (one tail)	1.52	

*Hypothesis accepted at 99 percent confidence level

Appendix Table A.10: F-test: Two Samples (FDI Firms-Own Survey and FDI Firms-WBES) Age

	FDI (Own Survey)	FDI firms (WB Enterprises
Variance	155.980	316.590
N	69	21
Hypothesised mean	0	
DF numerator	20	
DF denominator	68	
F statistic	2.0297*	
F critical, 0.01 (one tail)	2.16	

*Hypothesis accepted at 99 percent confidence level

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Appendix Table A.11: Test Comparing Proportion of Foreign Firms and Domestic Firms Exporting (WBES)

Description of Variables	Value
P_f is the proportion of foreign firms offering formal training to workers	0.43
P_d is the proportion of domestic firms offering training to workers	0.199
n_f is the number of foreign firms	21
n_d is the number of domestic firms	292
$\hat{P}$ is the pooled estimate for both proportions	0.214498
$S.E._{\hat{p}}$ is the standard error for the pooled estimate	0.092738
Z_{cal} is the computed test statistic	2.4909*

Note: Significant at the 0.05 level of significance